FLORIDA WILDLIFE®

Volume 45, Number 3
May-June 1991

TAKE A FRIEND FISHING

NATIONAL FISHING WEEK

JUNE 3-9, 1991

FLORIDA WILDLIFE

Volume 45, Number 3 **May-June 1991**

© Florida Game and Fresh Water Fish Commission 1991

Publisher

COMMISSIONERS

Chairman:	
Mrs. Gilbert W. Humphrey	Miccosukee
Vice Chairman: Joe Marlin Hilliard	Clewiston
Donald F. Wright	Orlando
Joseph G. Spicola Jr.	Tampa
J. Ben Rowe	Gainesville

ADMINISTRATION

Robert M. Brantly	Executive Director
Allan L. Egbert, Ph.D.	Asst. Executive Director
William C. Sumner	Administrative Services
Bob Edwards	Law Enforcement
Frank Montalbano	Wildlife
Smokie Holcomb	Fisheries
Bradley J. Hartman	Environmental Services
Duke Hammond	Informational Services

REGIONAL DIRECTORS

J.O. Brown	South Region
Larry Martin	Northeast Region
Robert Ellis	Northwest Region
Dan Dunford	Everglades Region
Robert B. Butler	Central Region

MAGAZINE STAFF

Andrea H. Blount	Editor
Peggy Perkerson	Art Editor
Scott Ball	Assistant Editor
Mary Beth Savage	Circulation Manager
Sharon Marshall	Electronic Typesetting
William A. Greer	Contributing Photographer
Laverne Roberts	Circulation Assistant

FLORIDA WILDLIFE (ISSN 0015-4369) is published bimonthly by the Florida Game and Fresh Water Fish Commission, 620 South Meridian Street, Tallahassee, Florida 32399-1600. Second-class postage paid at Tallahassee, Florida, Post Office Publication Number 202440. MATERIALS IN FLORIDA WILDLIFE include copyrighted materials that are property of individual contributors. WRITTEN PERMISSION TO USE the publisher's materials will be granted by the editor for noncommercial, public informational purposes. MANUSCRIPTS, PHOTOGRAPHS AND OTHER SUBMISSIONS are received only with the understanding that the Publisher assumes no responsibility for any loss or damage. Contributors should request "HOW TO SUBMIT" before sending materials, SUBSCRIPTION PRICES: $7 for one year (six issues); $14 for two years (12 issues); $20 for three years (18 issues).

Florida Panther

Read two articles about our endangered state animal beginning on page 9 of this issue.

Contents

2 **The Making of a Wildlife Officer,** By Mary M. Davis
7 **The Story of Lauri Rapala,** By Si Liberman
9 **Panther Capture Team Brings In Kittens,** By Henry P. Cabbage
15 **The Endangered Florida Panther,** By David S. Maehr and Chris Belden
19 **Florida's Stinging Caterpillars,** By James Phillips
21 **Lynn Hannon — She Makes Birds Fly,** By W. Horace Carter
25 **Florida's Steepheads: Unique Canyonlands,** By D. Bruce Means, Ph.D.
30 **Space Age Mapping In Florida,** By Randy S. Kautz
34 **Murder Springs Eternal,** By Bob McNally
37 **Spring Slabsides,** By Lt. Dewey Weaver
39 **The Big Catch Program,** By Mark Trainor
40 **1991-92 Florida Stamp Contest Winners,** By Mary M. Davis
42 **A Bio-Babble Primer,** By Scott Hardin

Departments

29 **Delicate Balance: Okaloosa Darter,** By Gray Bass
41 **1991-92 Photo Contest Rules**
44 **It's The Law,** By Inspector Kyle W. Hill
45 **Hunter Education,** By Lt. Rudy Howell
46 **Conservation Update**

Covers

Art Editor Peggy Perkerson rendered a Florida panther descending from a tree in this early-morning scene on our front cover. Using mixed media, she also created the close-up portrait on our back cover.

GFC

The Making of a Wildlife Officer

By Mary M. Davis

Dateline Miami: While inspecting Miami and Hialeah botanicas, Lts. Tom Quinn and Kathleen Kelley seized more than 200 vulture and hawk feathers, one gray fox head, one pair of red-shouldered hawk wings, 12 hummingbirds, nine kestrels, 19 woodpeckers, four finches and one mourning dove. They suspect illegal traffic is supplying protected species to Santeria cultists.

Dateline Apalachicola: Illegal dumping by septic tank service operators may be contaminating Apalachicola Bay. Sgt. Charles Chafin is seeking felony warrants for violators.

Dateline Lofton: Two men were rescued after being lost more than 10 hours during severe weather in the Nassau Wildlife Management Area. Wildlife Officers Don Bailey and David Waldo and Lts. Kevin Adkison and Mike Edwards searched by boat and on foot. They found the victims. They're okay.

Dateline Jacksonville: The waterways committee of the Duval County Commission accepted a Game and Fresh Water Fish Commission plan to resolve boating safety hazards on the St. Johns River. The plan, devised by Wildlife Officer Barry Pierce, includes speed zones, no-wake and no-skiing zones.

Dateline Tallahassee: As part of the Partners in Excellence program, Commission staffers sponsor the "Acorn Club" at Oak Ridge Elementary School. Volunteers such as Sgt. Henry Grimes interact with students to serve as positive role models and to improve relations between law enforcement officers and the public.

It takes more than basic law enforcement training to mold recruits into Florida wildlife officers. They must identify hundreds of similar animal species. They must recognize signs of environmental crimes, sometimes buried deep under ground. Officers must be physically and mentally prepared for search and rescue operations on land and water, no matter the weather, and they must master lifesaving techniques for injured or ill persons. They must be skilled communicators, able to persuade children and adults to abide by laws that conserve and protect wildlife and the environment.

To prepare recruits for duty, the Commission conducts 20-week training academies at the Law Enforcement Training Center in Quincy.

"The training academy provides in-depth training, field exercises and

GFC

Recruits must learn to recognize Florida's birds, mammals, fish and reptiles.

testing in 10 general areas: law, investigations, firearms, First Responder first aid, defensive tactics, communications, vehicle operations, patrol procedures and techniques, personal and social sciences and agency orientation," said Inspector Neil Branch, training director. "Recruits must participate in stringent exercises to develop strength and coordination."

"We use the academy to test recruits as much as to educate them," said Capt. David Melvin, curriculum coordinator. "It's tough, both in the classroom and in the field. We simulate real-life situations, so officers are prepared for the unexpected."

Agency Orientation

The first few days at the academy are spent in fittings for uniforms, discussing rules and learning about the agency.

Directors of the Commission's various divisions and offices explain departmental operations.

"We want recruits to understand how the divisions and offices work together," Melvin said. "As a Constitutional agency, we feel compelled to serve Floridians above and beyond the call of duty. We want recruits to feel that, too."

Law

"Wildlife officers are trained in all areas of law, not just game laws," said Jim Knight, Commission senior attorney and primary legal instructor. "Wildlife officers handle domestic complaints, homicides, drug cases, driving violations, even embezzlement."

Recruits learn civil and criminal law, probable cause, rules of evidence, arrest laws, search-and-seizure concepts and rules governing use of force.

However, Knight stressed, wildlife law is *not* secondary to general law. Recruits must understand rules and laws governing endangered and protected species, hunting, trapping and fishing methods, and the import and export of wildlife. To enforce these laws, officers must recognize almost every bird, mammal, fish and reptile that calls Florida home, as well as exotic species not welcome in the Sunshine State.

As a former assistant state attorney, Knight offers recruits a unique perspective of law enforcement.

"I try to bring the law alive with examples they'll encounter in the field and in court, to help them avoid mistakes that might sabotage a solid case," Knight said.

To help recruits understand the legal process, actual judges and attorneys work with recruits to prosecute "offenders" arrested in simulated investigations.

Investigations

Commission personnel and Florida Dept. of Law Enforcement (FDLE) crime lab analysts teach recruits to investigate criminal activities through interrogations and interviews and by collecting evidence at crime scenes.

For Karen Cooper, a biologist with 11 years of experience as an FDLE crime lab analyst, making recruits aware of physical evidence at a crime scene is her goal.

"I urge recruits to view crime scenes holistically," Ms. Cooper said. "Evidence is not limited to fingerprints and blood stains. We look at fibers from clothing, carpet or car interiors, glass, paint chips and body fluids. What they collect or don't collect could prove or disprove facts in an investigation. If they plaster-cast a tire track from the scene, we need the tires from the suspect's vehicle for comparison."

Recruits learn to secure, search and diagram crime scenes, locate and lift fingerprints, prepare evidence for crime lab analysis and follow strict evidence handling and transferring procedures.

Maj. Wayne Gellner, a Commission investigator with 20 years of law enforcement experience, teaches recruits to interview potential witnesses and interrogate suspects. He is quick to admit, however, that such skills are an acquired art rather than a science.

"What works for one wildlife officer may not work for another," Gellner said. "We teach interview objectives and systematic interview methods."

In 1985, the Commission became one of the nation's first wildlife law enforcement agencies to use the Kinesic interview technique.

"The Kinesic technique uses subtle, subconscious verbal and nonverbal behaviors to diagnose truthfulness or deception and to determine emotional state," Gellner said. "This helps us ask the right questions in the right sequence at the right time. The technique has raised confession rates significantly."

Recruits learn to obtain information from cooperative and uncooperative persons, including "leads" regarding evidence locations, possible witnesses, accomplices and other crimes.

"Not everyone is going to confess, but most people will admit to facts regarding the crime," Gellner said. ▷

Firearms

Fact: Five Florida wildlife officers have been killed in the line of duty since 1950. Given that grim statistic, it is no surprise that recruits spend more than two weeks of the five-month academy learning weapon use and care. And Capt. Bob Poole, primary firearm instructor and boating safety coordinator, trains recruits to respond immediately, lawfully and accurately in dangerous situations.

"I'm after more than a recruit who can hit a paper target. That's not real," said Poole, a 23-year Commission veteran. "I'm after a subconscious reaction, an instant recognition of a threat and an instant, appropriate response. We train recruits always to respond, always to win and never to give up, no matter what."

Recruits use the same model firearms issued to wildlife officers — the Smith & Wesson 5906 semi-automatic pistol and the Beretta 1200 semi-automatic shotgun. The training goes beyond the configuration and cleaning of weapons, troubleshooting mechanical malfunctions and sharpshooting in daylight and twilight conditions, as required by Florida's Criminal Justice Standards and Training Commission.

Poole uses state of the art training devices to sharpen combat shooting skills. The Firearm Training System is an interactive computerized laser video system that presents potential targets — from dangerous criminals to children and pets. The system computes reaction time, precision and, most importantly, whether the image should have been responded to at all.

Recruits participate in Paint Ball, a combat simulation training course with fast action, weapons and, yes, a little pain. Recruits use air guns firing small balls filled with paint in shoot/don't shoot scenarios.

"With Paint Ball, recruits know immediately whether they've hit the target and where. The recruit who is hit gets an instant reminder of his mistake," Poole said.

The Laser Vest/Firearm System is the academy's third modern training device. Wearing laser-activated vests, recruits simulate one-on-one deadly threat situations. If a recruit is hit by a laser beam, his vest indicates this visually and audibly so he can learn to protect vulnerable areas.

"Most people we deal with are law-abiding citizens, happy to see us protecting their resources. But firearm training is like a parachute. You hope you never need it, but if you do, it's got to work the first time," Poole said.

First Responder

Recruits learn to handle medical emergencies through First Responder, a 50-hour training course developed by the National Highway Traffic Safety Administration, the American Red Cross and the American Heart Association. Students learn to make preliminary assessments of injuries and illnesses, then to administer lifesaving measures. They learn to move patients with multiple injuries safely and to determine the order in which accident patients receive treatment.

"Wildlife officers must be prepared to handle any medical emergency," said Melvin, who coordinates the First Responder program. "Our officers usually are first on the scene at hunting accidents, and often we're called to help in remote wilderness areas."

Recruits participate in field exercises to simulate the stress and confusion they will face at accidents in the field. During one exercise, a "squirrel hunter" interrupts a classroom discussion to direct unsuspecting recruits to an isolated "accident."

"In addition to a plane in the middle of nowhere about to burst into flames and six severely injured children and adults, recruits must deal with a hunter who wants to be in charge since he was first to discover and report the accident. We instruct him to get in the way as much as possible," Melvin said. "We can talk about handling these situations, but only experience gives recruits confidence to handle real life."

Defensive Tactics

"The public expects law enforcement officers to take charge in hazardous or illegal situations, but to use minimum force," said Lt. Kathleen Kelley, primary instructor for the defensive tactics curriculum. "Wildlife officers patrol wilderness areas where back-up is usually miles away. Persuasive communication and solid defensive skills are a must."

First Responder medical emergency techniques are critical. GFC

GFC

Recruits participate in fitness exercises and practice defensive tactics.

Half of violators challenge an officer's authority, at least verbally. Almost 12 percent resist physically, Kelley said. Defensive tactics training gives officers maximum control with minimum effort, in an effective, systematic and defendable manner.

Recruits learn to weigh a violator's actions against a "Force Continuum," a five-step guideline that outlines the force necessary to gain compliance from resisting subjects. Most subjects comply after an officer reasserts his presence and authority (step one) and uses persuasive dialogue (step two). If force must be used, an officer first employs empty hand control (step three) and an impact instrument (step four), then, as a last resort, a firearm (step five).

"It's every officer's goal *not* to use physical contact," Kelley said. "Recruits learn to be persuasive and to phrase warnings to let people save face."

Through instructional videos, exhibitions and practice, recruits learn how to hold suspects for maximum control, where to strike a person to gain control without causing serious injury and how to block blows from violent suspects. They also learn to handcuff, search and transport suspects.

"Recruits take the suspect's age, sex, size and skill level into consideration when using force," Kelley said.

Communications

The academy's communications curriculum involves both written and radio communications. Robin Broadway, an instructor at the Center and former Titusville Police sergeant, teaches recruits to prepare effective, standardized field notes and reports.

"If they haven't documented everything needed to prosecute, their work may be for nothing," Ms. Broadway said.

Ms. Broadway uses a diagnostic test to measure recruits' observation and communication skills.

"Officers must learn thorough reporting, to record anything that might be pertinent, even a person's off-hand comments," Ms. Broadway said. "For criminal cases, it's vital that every 'element of the crime' be noted. Without proof that a crime took place, a judge might reduce charges or throw out the case.

"Reporting only the 'who, what, when, where, why and how' won't do anymore," Ms. Broadway said. "Getting the facts down right, even in a tense or dangerous situation, is vital to successful prosecution."

Bill Barker, a 24-year Commission veteran with 31 years of law enforcement radio communications experience, teaches radio curriculum.

"A radio is a tool, and like other tools, it won't work if it's not used properly," Barker said. "The radio is a lifeline to the world when alone in remote areas. So, for their own safety, they'd better use it to its maximum efficiency."

Recruits learn the phonetic alphabet and more than 75 "10 signals" — radio codes that relay information concisely. Communications must be brief so every officer has immediate access.

Barker activates a radio system at the Law Enforcement Training Center during the academy.

"When recruits drive on campus, and during simulated investigations, they use the academy radio," Barker said. "When they graduate, they've had practice and can use the radio correctly in the field."

Vehicle Operations

Lt. Chuck Gaylord, an 11-year Commission veteran who has worked with the St. Petersburg Police Dept., Florida Division of Driver Licenses and FDLE, coordinates vehicle operations instruction.

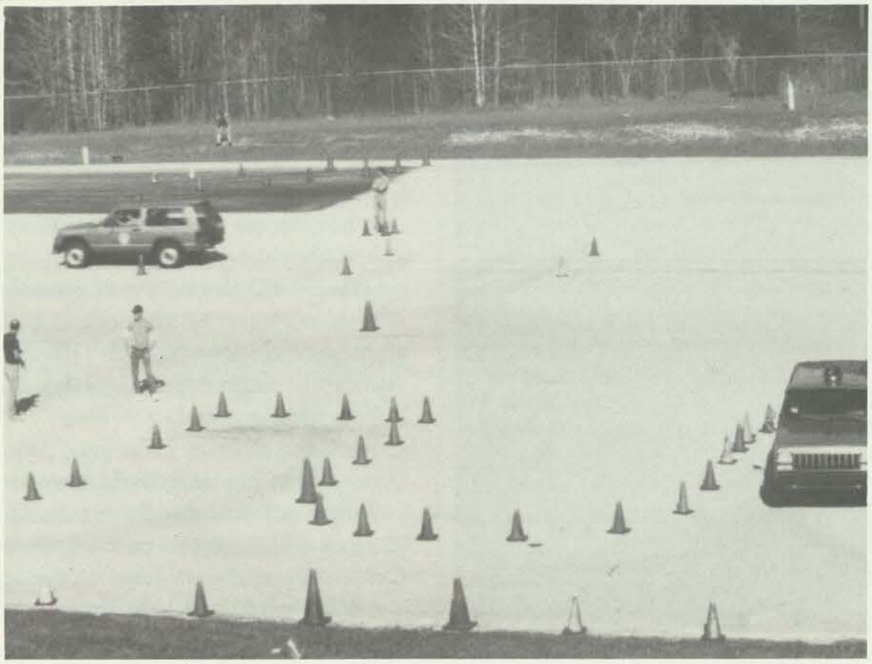
"Our goal is to mold proper attitude and to familiarize recruits with techniques used in highway and off-road driving," Gaylord said.

During 16 hours of classroom instruction, recruits learn controlled braking, cornering, off-road recovery, evasive maneuvering and skid control. Then, they practice on the driving course.

"We spend time in the woods negotiating rough terrain and dirt roads," Gaylord said. "We'll get a vehicle stuck to practice using a winch and a high-lift jack."

But attitude is the primary objective of vehicle operations training.

"We cannot over-emphasize our responsibility as law enforcement officers to set an example. Competitiveness has no place in law enforcement," Gaylord said. "Recruits learn to recognize their personal limitations and the vehicle's limitations. They may need ▷



Vehicle operations training includes cornering, controlled braking, off-road recovery, evasive maneuvering and skid control.

GFC

to give up a chase if it could be dangerous for the public or themselves."

Patrol Procedures and Techniques

"Patrol Procedures and Techniques is the most comprehensive block taught at the academy," said Lt. Mikel Suelter, a 17-year Commission veteran who, along with Poole, teaches the course to recruits. "Recruits learn to use their new surveillance, firearms, defensive tactics, investigation, observation and tracking skills in a safe but effective manner."

Recruits learn procedures to approach persons in cars, trucks, vans, motor homes, on motorcycles and on foot, and how to maintain communication with the radio dispatcher.

"There is no such thing as a routine stop," Suelter said. "A license check or witness interview could turn nasty if the person has an outstanding warrant or has committed a crime you don't know about.

To demonstrate that even "routine stops" can become dangerous, Poole and Suelter coordinate mock encounters with the public.

"Recruits serve a warrant at a trailer," Poole said. "This seems innocent enough, but the people are armed and violent. We evaluate recruits as they determine that the situation is dangerous and determine proper response.

"We're here to protect and help the public. If we want to be respected, we must be friendly. An officer may make an honest mistake and stop the wrong person. We want that person's respect, and the respect of an arrested person, when it's over," Suelter said.

Personal and Social Sciences

Recruits spend their final days at the academy in introspection, according to Lt. David Stermen, watch commander in the Commission's South Region and instructor of the human behavior and social sciences curriculum.

"We examine why people react the way they do and how they communicate," Stermen said. "They look closely at why they chose law enforcement as a career and what they expect to be able to do. We look at how they will deal with discovering that they can't get every poacher out of the woods. We ask recruits to examine their prejudices and how they might affect job performance."

Stermen, who taught high school before joining the Commission 19 years ago, bases his instruction on Maslow's Hierarchy of Needs.

"Human responses are based on needs for food, water, sleep and shelter, or the more complicated needs of esteem, self-actualization and a sense of belonging," Stermen said.

"We teach recruits that elderly people need to feel secure. When a senior citizen reports a non-threatening 3-foot gator as a nuisance, the officer must be aware that a need for security is involved," Stermen explained.

"The gator may not appear threatening, but to an elderly person, it's a threat to his pet, which threatens his happiness and security, and even a personal threat if the person doesn't get around well. Understanding this, the officer will take time to explain alligator habits and how to be safe instead of saying the gator is not a threat and going on with his day," Stermen said.

Stermen teaches recruits to recognize stress in themselves and in fellow officers.

"As an occupational group, law enforcement officers are susceptible to stress-related illnesses. And we don't need a stressed-out officer on patrol," Stermen said.

Once training is complete, recruits must prove themselves in the field to gain official status as Florida Game and Fresh Water Fish Commission wildlife officers. For eight weeks, recruits are supervised by seasoned officers. Only if recruits are able to apply academy training to real-world situations are they certified.

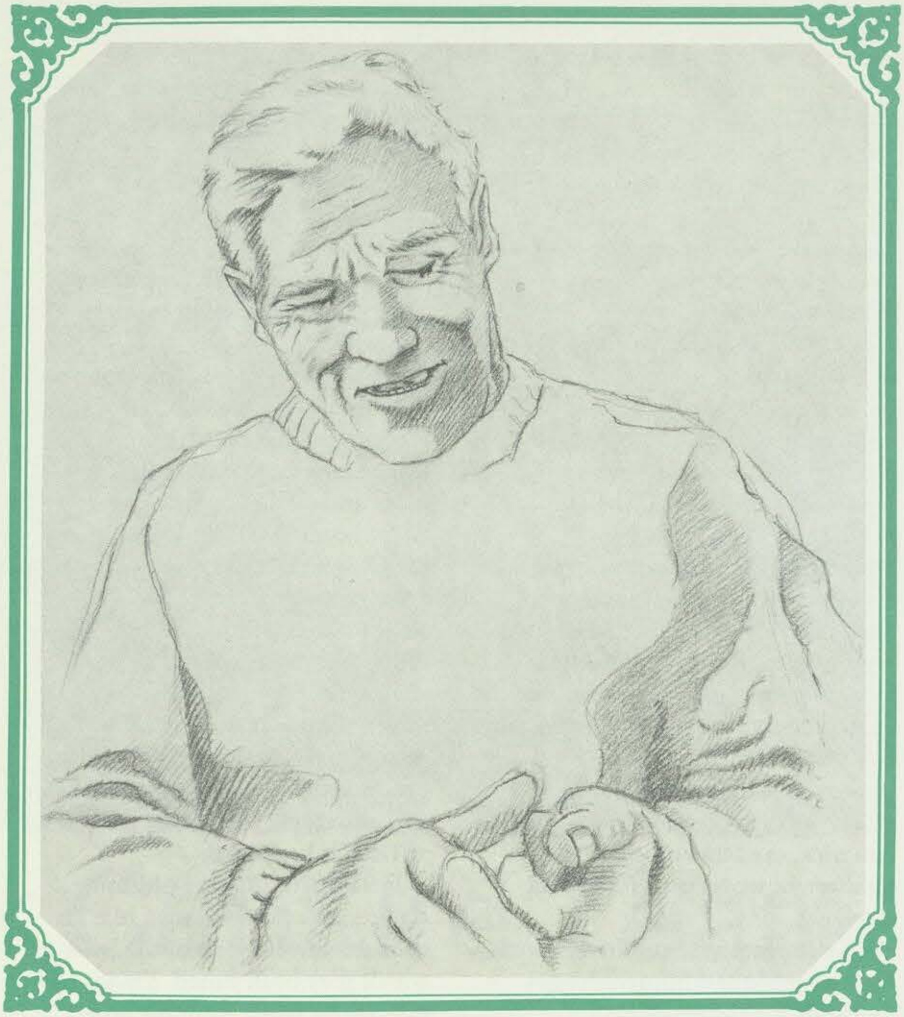
For more information about how to become a wildlife officer, contact your regional Commission office.

Mary M. Davis is the Tallahassee information specialist for law enforcement. She attended academy training sessions, worked with wildlife officers and rode on patrols to research this article.

The Story of Lauri Rapala

By Si Liberman

A poor Finnish fisherman turned his hand-crafted lures into a multi-million dollar industry.



Life called it "the lure fish can't resist." But until 1962, when the magazine reported that a new minnow-like lure was mesmerizing fish, the name "Rapala" was as foreign to Americans as America was to the man who created the lure.

Twenty-nine years later, Rapalas still are probably the most coveted and copied lures in North America and Europe. And the story of the success and tragedy of Lauri Rapala, the impoverished Finn who invented them and gave birth to a multi-million-dollar industry, spawns legend.

Rapala was born out of wedlock in 1907 and never learned his father's identity. He had no last name until he was 5 years old, when a priest christened him Rapala, after the town in Finland where he was born.

For more than half of his 67 years, poverty and fishing were his way of life, except for the war years, when he fought the Russians and then the Germans.

He briefly tried farming and lumberjacking, but found the forest lakes near his home more inviting. Home was a one-room log cabin that he shared with his wife, Elma, and their five sons and two daughters in Vaaksy, a small village about 100 miles from Helsinki. Today, the town is the home of the main Rapala factory with 250 employees, who turn out more than 100 different lures in varying sizes, colors and models.

Before he had a fishing rod, Rapala used nets with live bait and scores of hooks. He'd row his wooden boat far offshore and fish for days at a time, his children recall.

If lucky, he'd return with several hundred pounds of trout and pike. Other times, nothing. In the winter, he'd ski for miles over countryside and frozen lakes, lugging a sled, then cut holes through the ice to drop his bait lines.

It was during the terrible Depression years of the 1930s that Rapala fashioned his first lure. For hours at a time he had watched and studied how minnows zipped by and around trout and pike that appeared poised to strike.

"I saw that the big fish would wait to select one minnow from all the rest," he said. "The minnows struck by the game fish invariably had a flaw in their swimming rhythm."

The seemingly weak or sick minnows would become victims of the big fish.

And that's when the idea hit him — a lure that moved like a wounded minnow.

Lightweight material, he concluded after several experiments, worked best at imitating the motion of a weakened minnow. He whittled pine bark into the shape of a ▷

minnow, covered it with tinfoil from candy wrappers and drew scales with a pen and ink.

It did the trick, and the inventor graciously shared his feather-weight lures with fishing buddies and neighbors. Word spread, and Rapala soon learned that sportsmen were willing to pay for them.

But the Russian invasion and his enlistment in the army in 1939 brought an abrupt end to the makings of a promising business. Nearly six years passed before the fisherman rejoined his wife and children.

Rapalas, and news of how they attracted fish, reached the United States and Canada in the late 1950s. The inventor had sent some lures as gifts to former neighbors who had emigrated to Florida and northern Minnesota. By then, he had improved the lure by using balsa wood imported from South America, the same type of lightweight wood used for model airplanes.

Their spectacular results inspired Finnish pride and unprecedented demands for the product.

Finns revisiting their native land were urged by friends to come back with Rapalas that trout, pike and bass of all sizes seemed to find irresistible. The handmade lure's American arrival came at the same time lighter weight rods, reels and monofilament lines were coming into their own.

The demand became so intense that anglers, especially in the north shore area of Lake Superior, willingly parted with up to $25 to rent or buy one from savvy entrepreneurs. Sporting goods stores reportedly were hoarding and selling them under the counter at inflated prices.

"They were the hottest thing since sliced bread," recalled John Chiola, owner of the J & J Tackle Manufacturing Co. in Belmar, N.J.

Through a series of letters, a Minnesota tackle salesman and his partner convinced Rapala to give them North American rights to Rapalas.

To meet unexpected demand, Rapala and his sons enlisted help from as many townspeople as could work in their own homes. They could barely turn out the handcrafted devices fast enough.

Rapala became a local hero who had brought new employment and prosperity to the small town of Vaaksy.

Succeeding generations of lures were designed for saltwater trophy fish such as tarpon, stripers, king mackerel, snook and redfish.

He and his family moved into a larger home. He ultimately visited the U.S. and fished near the Minnesota-Canada border, and he was honored with visits from Prince Philip and the president of Finland.

New fishing lures and mushrooming business had established Rapala as the Cadillac producer in an ocean of competitors and imitators.

Then it happened.

In 1965 his 26-year-old son, Kauko, an avid fisherman like his dad, drowned in one of the lakes in which they both fished. Kauko had apparently fallen from his boat. When the body was found several days later, a Rapala lure was hooked onto his trouser leg.

The loss was too much.

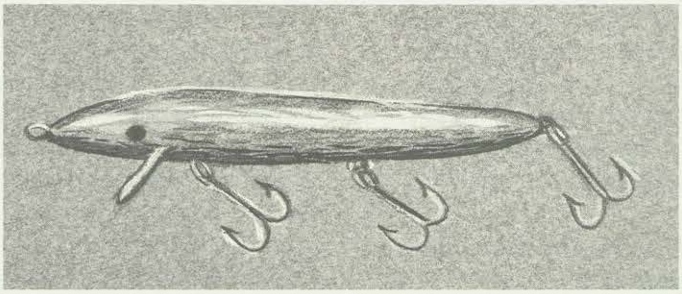
"He never was the same after that," said 57-year-old Risto Rapala, the eldest son, who with his brothers Ensio and Esko and grandchildren, operate the company now. "To him, it meant simply that the waters which had been so good to him had now demanded a gruesome repayment."

Lauri Rapala began drinking heavily, lost interest in the company he had founded, relinquished its operation to his children and squandered most of his wealth.

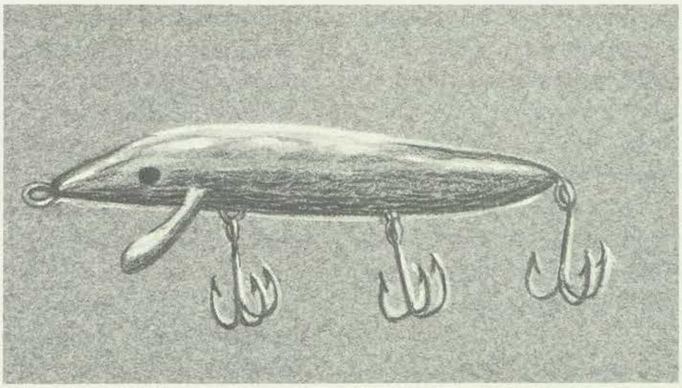
When death came in 1974, his personal estate amounted to only $27,000.

This year, the company, with plants in Finland and Ireland, will gross $60 million, according to sales manager Pertti Raudio, and its products are luring more fishermen than ever.

Si Liberman is a traveling free-lance writer who retired as Sunday editor after 33 years with ***The Asbury Park Press****, a N.J. newspaper.*



Two versions of the Rapala lure.



WILLIAM A. GREER

Panther Capture Team Brings in Kittens

By Henry P. Cabbage

Two sets of tracks — one smaller than the other — side by side on a wet, sandy trail in the southwest Florida wilderness confirmed that Panther No. 31 had at least one kitten with her.

It was worth it to take time to follow the tracks a few yards and trace a few minutes of the cats' lives. We could picture the slices of life the tracks revealed — like the spot where the larger cat had walked around a shallow puddle while the playful kitten had splashed through it.

"Just like a kid," said wildlife veterinarian Dr. Melody Roelke to her assistant, Marnie Lamm. "Adult cats tend to walk on the dry part of a trail when they can, but kittens want to play in the water along the way."

Earlier in the day, the capture team had split into two squads. Professional cat tracker Roy McBride, who works under contract with the Florida Game and Fresh Water Fish Commission, and his dogs led biologists Dave Maehr, Walt McCown, Darrell Land and Jayde Roof to a tree where No. 31 had taken refuge. The trackers didn't see any kittens. Meanwhile, Dr. Roelke and Ms. Lamm searched for signs of a kitten with help from a couple of visiting biologists: Jim Cox of the Commission and Larry Richardson of the U.S. Fish and Wildlife Service. That's when they found the two sets of tracks.

The trackers didn't want to subject No. 31 to unnecessary stress, so they simply left after making some mental notes about her physical appearance. They commented that she seemed to be eating better than expected for a wild predator raising young. Normally she wouldn't be so well-fed unless something had happened to the kittens.

"That's not a good sign," Maehr said. "Then again, it might not mean anything."

The trackers decided to try to locate the panther kittens late the next morning when the mother probably would be with the litter.

Maehr, who is in charge of the Commission's South Florida panther research efforts, already knew a great deal about the litter. A radio collar on No. 31's neck had enabled scientists to follow her movements and activities for the past two years. She had been in the company of ▷

male panther No. 12 during the spring of 1990. You don't find panthers together like that unless they are mating, so there is little doubt that No. 12 is the sire of No. 31's latest litter.

"The kittens ought to be about 6 or 7 months old," Maehr said. "Panthers usually give birth to one-to-four kittens. One or two of them might survive the first year."

It was late February, but mosquitos still were swarming in the area a few miles northeast of Naples. Winter usually doesn't pack much of a chill in those parts, so the trackers keep their insect repellent handy year round. The climate poses other problems. For instance, by the time spring settles onto south Florida, the weather is too warm for capturing panthers. The heat would make the procedure too stressful for the animals.

Scientifically, No. 31 is a particularly important cat. Since she has no known living parents or siblings, she is a founder animal — one with genes that can't be salvaged from any other animal.

The plan was to bring some founders and their kittens into captivity to begin breeding them for reintroduction into the wild. However, scientists had to back off the plan to capture the adult cats when animal rights activists filed a lawsuit in January challenging the captive breeding program. An agreement to capture only kittens this year enabled researchers to continue the project rather than risk allowing the lawsuit to delay the program until it would be too late to save the panther from extinction.

No. 31 and five other founder females have borne litters this year, and those are the kittens that will be the focus of the trackers' activities for the next few weeks.

The morning after the first attempt to find No. 31's kittens had failed, panther trackers used an airplane with a special receiver to scan the airwaves for the signal from No. 31's radio collar and pinpoint her location. Once they knew where she was, the trackers boarded swamp buggies and headed toward her. That's one thing about tracking Florida panthers — swamp buggies never fail to come in handy. Neither do airplanes, radio collars, tracking dogs nor any other device to give trackers an advantage over an animal so ideally equipped for survival in the swamp.

Within a few minutes, McBride's dogs picked up the cat's scent and began the barking and howling that dogs can't hold back when they're excited.

"OOOWF...OOOWF...AARF..." resonated through the woods. And then, except for an occasional "WOOF," the noise stopped abruptly.

The chase was so brief it was almost a disappointment when McBride's voice crackled over the radio, "We've got a kitten up a cabbage palm."

At that instant, the relatively casual pace of the hunt was over. The panther capture team charged into its mission.

With biologists and the veterinarian en route, McBride tied up the two dogs to ensure they wouldn't get in the way once the rest of the team arrived. McBride used the radio to notify the rest of the team of his general location.

"Hey Roy!" McCown said over the radio. "Give us a shout so we can pinpoint where you are."

A few seconds later, the sound of the barking dogs pierced the wilderness.

"You sound like a dog," McCown said. The joke was just too obvious to pass up while the swamp buggy labored toward the sound.

The barking provided all the guidance necessary for the team to assemble at the foot of the 30-foot cabbage palm with the kitten still at the top, eyeing the commotion below him.

"The mother ran up another tree," McBride said. "She'll probably just stay up there until we leave, or she may climb back down and take off."

It was unlikely, at that point, that the mother would charge the trackers to reclaim her kitten.

It was impressive to watch the

WILLIAM A. GREER

The tracker and his dogs led biologists to the cat.

team shift into its routine. Nobody shouted instructions to the others; it wasn't necessary. Dr. Roelke began preparing a tranquilizer dart that McBride would fire into the kitten's haunches. The chore tested her skill at estimating the weight and general condition of the kitten. Too potent and it would put the kitten's life at risk. Mix it too weak, and it could be the capture team that finds itself in danger.

Meanwhile, Ms. Lamm, Dr. Roelke's assistant, cleared an area and set up an assortment of equipment to gather samples of blood and other fluids from the animal. She also set up an array of medications to head off any potential emergencies, such as the kitten having an adverse reaction to the tranquilizer.

A few yards away, McBride slowly circled the tree two or three times, trying to pick out the best angle to fire the dart.

While all that was going on, Maehr, McCown, Land and Richardson cleared an area beneath the tree to make room for a safety net. Nearby, Jayde Roof, the scientist who actually had to climb the tree and get the cat, grumbled about the fact that this particular animal chose to run up a cabbage palm, rather than a nice cypress tree.

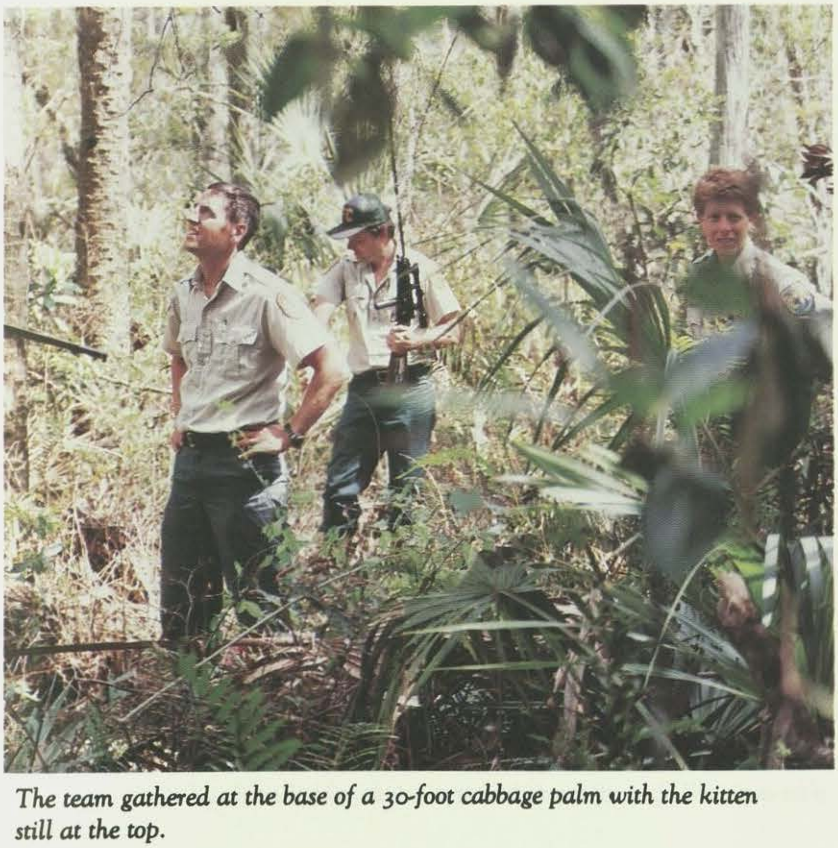
"I hate that," he said, pointing to the dead fronds he'd have to break off to reach through knife-like green fronds to get to the young animal.

McBride aimed the dart gun.

"POW!"

A perfect shot. The dart hit its mark in the muscular upper part of the kitten's left rear leg. The tranquilizer required five minutes or so before it was safe enough for Roof to begin making his way up the tree.

If the kitten had been up a cypress tree, Roof could have rigged up a type of harness to hold the animal. Then the rest of the crew could have lowered the cat to the ground gently. Not so with a cabbage palm. A cypress tree has limbs to grip and to stand on, but a palm has a relatively straight trunk with a cluster of unfriendly fronds at the top.


WILLIAM A. GREER

The team gathered at the base of a 30-foot cabbage palm with the kitten still at the top.

Roof began making his way up the tree, dreading the powdery base of the dead fronds that would get into his eyes, nose and mouth as he struggled to reach the kitten. Roof also broke off a bunch of dried out dead fronds and dropped them as he made his way up the tree. It was amazing how many of them landed squarely on McBride's head even though Roof wasn't aiming at him. He hit Maehr a couple of times, too.

"Hey...hey...heeey!" the two victims shouted, good-naturedly, as the dead fronds came crashing down on them. The men couldn't move out of the way though; they had to stay there and hold the net. No matter what, you have to protect the cat.

Suddenly, Roof reached through the fronds and maneuvered the cat out to the side away from the tree. He couldn't pull it down through the sharp, green fronds and risk cutting himself or the animal. His only choice was to hang on to the tree with one hand and to hold the kitten over the net with the other.

To keep the kitten from falling head first into the net, Roof skillfully swung the kitten into a horizontal posture just as he released his grip.

Perhaps the fall took one second, but it was the longest second in history. Then it was done. The kitten fell into the net perfectly — unharmed.

"Good job Jayde," somebody said.... Then again, maybe everybody said it. Everybody certainly thought it.

What happened next was a case study in precision and coordination. As the team went to work on the kitten, nobody had to say, "Put him over here," or "Be careful with him." Nobody had to say anything. It was as if the whole team was controlled by a single mental command center. Everybody knew exactly what to do, what to hold, what to hand to somebody, where to get everything and where to put everything. It was beautiful to watch. ▷

It took a full 90 minutes of work to perform the tests and measurements that had to be completed before the tranquilizer wore off. Trouble was, the tranquilizer took only about an hour to wear off.

"This cat's growling," Dr. Roelke announced into the microphone of the tape recorder she used to document every detail of the procedure.

It wasn't much of a growl, but it was enough to alert the team that unless the animal got another dose of tranquilizer within a couple of minutes, the researchers were going to have 37 pounds of trouble on their hands.

Dr. Roelke prepared the injection that calmed the 7-month-old male kitten again.

You have to wonder what went on in the kitten's mind with all the unfamiliar sights and sounds and smells that bombarded his senses. He did manage to protest with a definite snort when Dr. Roelke inserted a cotton swab into the kitten's nostrils to gather fluids for testing.

"Almost finished," the veterinarian said while she and her assistant carefully worked through the last few minutes of gathering, labeling and packing the samples of body fluids, parasites and fur to document what will add to the sum total of what's known about the mysterious cats called *Felis concolor coryi*.

McCown, the burliest member of the team, volunteered to carry the cat for the 100-yard hike back to the swamp buggies. His face revealed his pleasure at being lucky enough to carry an animal so rare that few people ever even get to see one. It was not hard to imagine what the cat would do to McCown if the tranquilizer wore off at that juncture. Apparently, that thought occurred to McCown, too when the kitten began to show signs of regaining its senses.

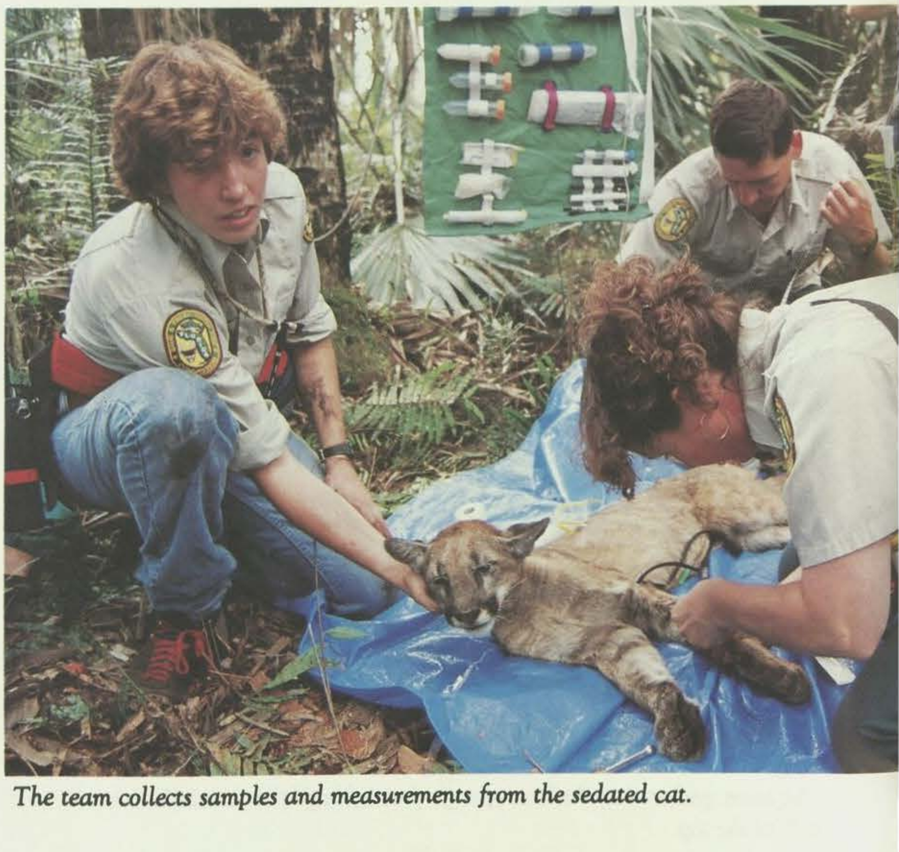
"Got another syringe of that stuff?" he asked Dr. Roelke.

She nodded yes, and a few seconds after she administered

WILLIAM A. GREER

The 7-month-old male kitten was the first to be taken for the captive breeding program.

As the team went to work, nobody had to say, "Put him over here," or "Be careful with him." Everybody knew exactly what to do.



The team collects samples and measurements from the sedated cat.

another dose of tranquilizer to the kitten, the team was on its way back to civilization.

Dozens of journalists from throughout southern Florida, with network and wire service connections that span the globe, had asked to be notified of every development in the battle to save the Florida panther from extinction. They had been told of the plan to capture the kitten and waited at the field house of the nearby Florida Panther National Wildlife Refuge.

With satellite trucks standing by, video cameras focused on the capture team as it pulled into the driveway. Note pads, microphones, still cameras with motor drives — all the latest and the oldest in communications technology descended on team leader Maehr as he announced that the panther trackers had captured the first of six kittens to be taken for the captive breeding project this year. Maehr fielded a barrage of questions from reporters assigned to cover the historic event.

"Yes, the kitten is all right," he said. "Yes, we intend to catch five more in the next few weeks....No, we don't know at this point if there are more kittens in this litter....No, panthers are not black...."

Only briefly, the team was able to open the cage where the still-woozy kitten struggled to hold its head up for photographers. Any more than a couple of minutes in that kind of crowd would have placed unnecessary stress on the kitten.

"Okay, that's enough," Dr. Roelke said. "Time to take the kitten (to White Oak Plantation)." Owned by Gilman Paper Company and situated near Yulee in north Florida, White Oak Plantation is the site of a panther captive breeding facility.

A minute or two later, the truck bearing the kitten was gone, and reporters went back to devouring every detail shared by everyone on the capture team or involved with panther research in any way."

"I'm a toter," wildlife biologist Darrell Land told a reporter who questioned him about his role in the kitten capture.

"A what?" she asked.

"A toter," he repeated. "When we go out to capture a panther, I tote some of the equipment."

Not long after that, the press conference ended, but the public's insatiable appetite for news of the Florida panther has yet to diminish.

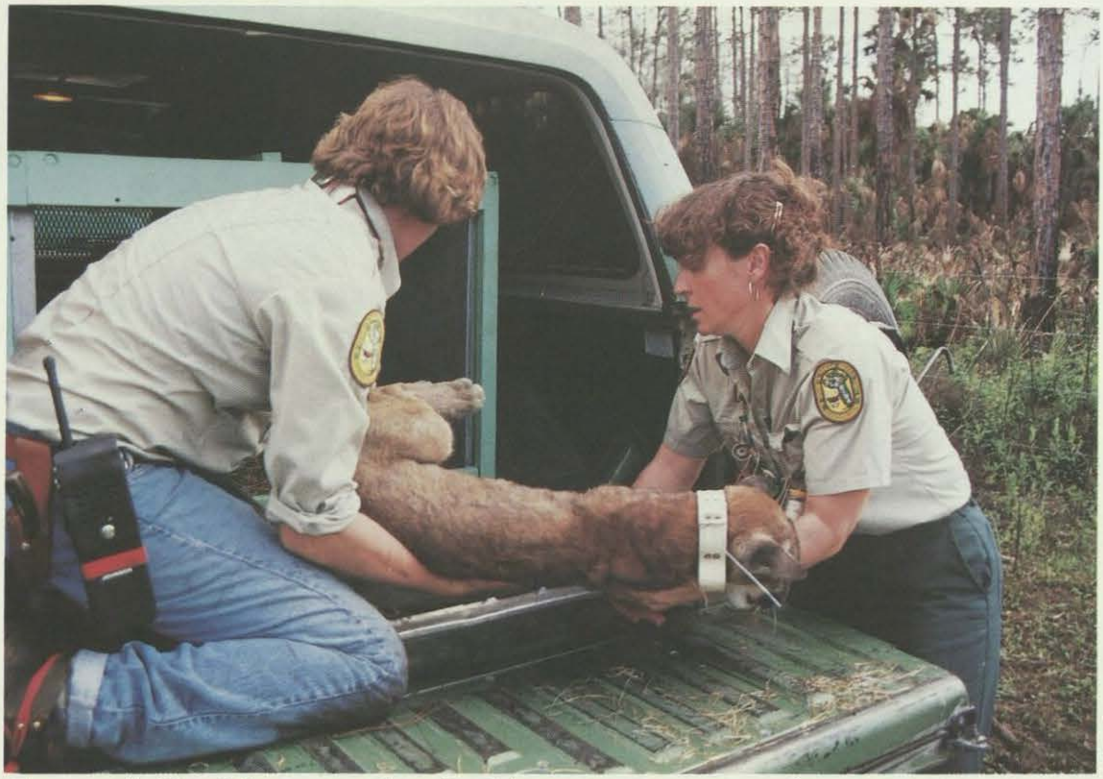
In the weeks that followed, the trackers captured a female kitten from the same litter and two more males from a litter born to Panther No. 9. The scientists already had decided to pick up no more than three males this year, so they are waiting for one of the other known litters to get a little older so they can try for two additional females.

The last hope of saving this magnificent subspecies from slipping into the gaping jaws of extinction may lie in the extremely limited genetic pool of the panthers already in captivity and in those to be brought into captivity in the next few years.

Time is short, and the price of failure would be high. ▷

Henry P. Cabbage is public information director for the Commission's Office of Informational Services.

WILLIAM A. GREER



WILLIAM A. GREER

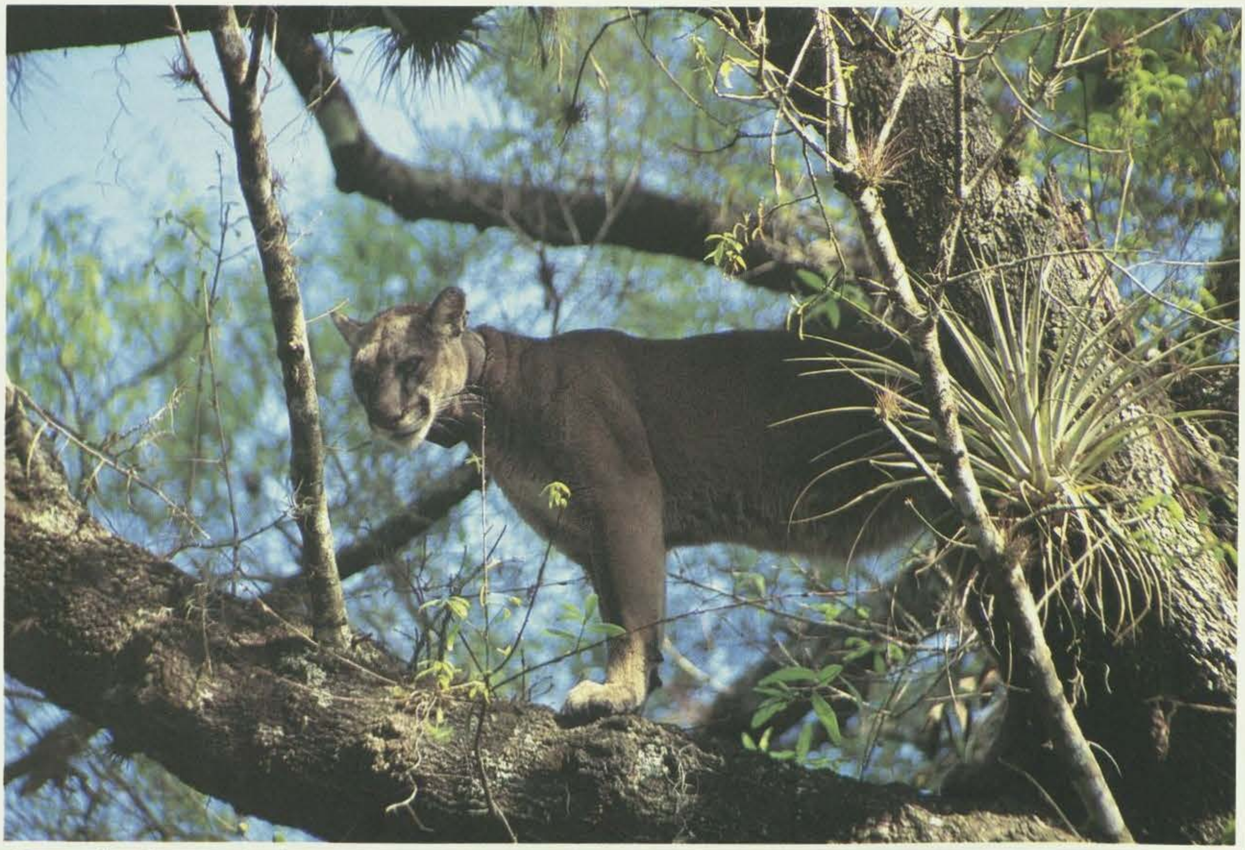
The 7-month-old male kitten was radio collared for extra security, a routine for captive cats.

Florida Panther Facts and Figures

	Average Weight	Average Length	Average Home Range Size	Age at 1st Reproduction
Males	122 (102-154) lbs.	83 in.	220 square miles	3 years
Females	86 (68-108) lbs.	76 in.	75 square miles	1.5 years

Preferred habitat: hardwood hammock, pine flatwoods
Preferred foods: white-tailed deer, wild hog
Litter size: 2 (1-4)
Litter interval: 23 months
Breeding season: year round (but mostly during winter)
Longevity: about 10 years
Other names: Cougar, Puma, Catamount, Painter, Screamer & Mountain Lion

Member Agencies of Florida Panther Interagency Committee:
Florida Department of Natural Resources
Florida Game & Fresh Water Fish Commission
National Park Service
U.S. Fish & Wildlife Service



Captive breeding may be the last hope for this endangered species.

DAVID S. MAEHR

DAVID S. MAEHR

The Endangered Florida Panther

By David S. Maehr and Chris Belden

Persisting against great odds, the endangered Florida panther remains a vital part of South Florida's subtropical landscape. Urban sprawl, checkerboards of agriculture and criss-crossing roads and canals have changed a once-vast wilderness to a human-dominated landscape. Nonetheless, these predators inhabit an area covering more than 4 million acres, living in many ways as they have since prehistoric times.

The Florida panther (*Felis concolor coryi*) is one of several subspecies of mountain lion, a species that has the widest distribution of any mammal in the Western Hemisphere. The Florida cats are relatively dark in color, with short, stiff fur. Contrary to popular belief, the Florida panther is not black. The unspotted coat of the adult is typically rusty reddish-brown on the back, tawny on the sides and pale gray underneath.

Compared to other subspecies, Florida panthers have longer limbs and smaller feet. At about 7 feet long and weighing as much as 154 pounds, male Florida panthers stand approximately 24-28 inches at the shoulder. Females are considerably smaller, with an average weight of 86 pounds and average length of 6 feet.

Where Do Panthers Live?

Panthers prefer habitats that provide well-drained forest cover, such as hardwood hammocks and pine flatwoods. Other habitats include mixed hardwood swamps, cabbage palm woods, thicket swamps and cypress swamps. Generally, panther habitat provides secure cover for resting, denning and travel as well as an abundant food supply. Mixed swamp and hammock forests also contain an abundance of seed-producing plants that provide cover and food for the panther's primary prey — white-tailed deer, wild hogs and other small animals such as raccoons, armadillos and rabbits. These habitats are found on large, public-owned lands such as the Florida Panther National Wildlife Refuge, Big Cypress National Preserve, ▷

Everglades National Park, Fakahatchee Strand State Preserve, Everglades Water Conservation Areas and large, adjacent private ranches. Panthers generally avoid urban and agricultural areas.

Breeding populations occur in South Florida from Lake Okeechobee southward, primarily in the Big Cypress and Everglades regions. Although periodic confirmed sightings have come from other areas, particularly along the St. Johns River, panther sign cannot predictably be found anywhere except in the Big Cypress and Everglades regions.

Why is the Panther Endangered?

The panther once was found throughout the southeastern coastal plain, but is now limited to an estimated population of no more than 50 adults in southernmost Florida. The decline of the panther began with the first European settlers, who considered the animal a nuisance. As civilization advanced, bounties were offered, and panthers were destroyed at every opportunity. By the mid- to late 19th century, the panther had been extirpated from most eastern states.

Present threats to the survival of the Florida panther are varied and interrelated, but all can be traced to an increasing human population. Studies of panthers in the early 1980s indicate that highways contributed significantly to panther mortality. Documentation of traditional travel routes, especially through the Fakahatchee Strand, resulted in construction of wildlife underpasses, incorporated into the conversion of S.R. 84 to I-75. Not only have underpasses been used regularly by panthers, but other species including black bears, white-tailed deer, wild turkeys, bobcats and alligators have been protected from highway collisions.

Florida panthers are susceptible to a number of diseases, parasites and possibly environmental contamination. Furthermore, inbreeding — a problem increased by low population size — appears to have reduced the genetic variability and may have reduced the fitness of panthers in Florida.

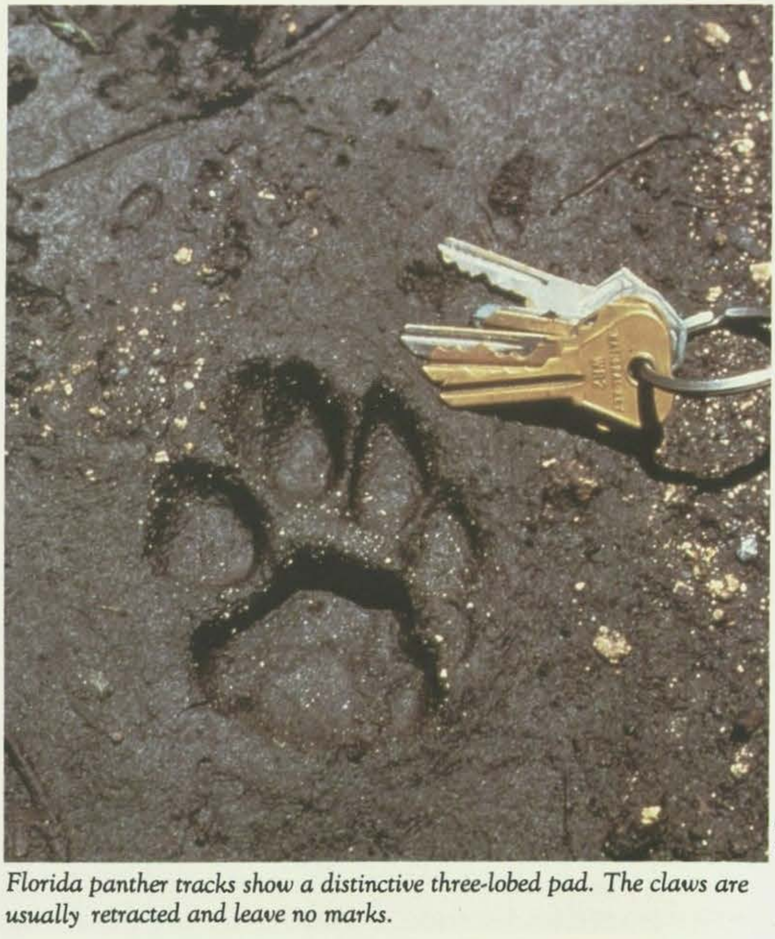
The common thread connecting the problems facing the Florida panther is habitat loss. With the development of Florida as a resort haven and an agricultural center, the vast forests that once blanketed the state became isolated fragments, unable to support populations of large predators like panthers. Drainage of swamps and development in deer and panther habitats diminished the quality and size of wild areas. Only in South Florida, where there are large tracts of public and private lands, is there a landscape currently supporting these wide-ranging cats.

What's Being Done to Help the Panther?

The first move to protect the Florida panther was to declare the animal a game mammal in 1950. This restricted the taking of panthers to certain seasons and put a halt to the indiscriminate killing of panthers as a "nuisance species." In 1958, the panther was removed from the native game list and given complete legal protection by the Florida Game and Fresh Water Fish Commission. The U.S. Fish and Wildlife Service listed the Florida panther as endangered on March 11, 1967.

Florida panthers now are legally protected from harm under the Federal Endangered Species Act of 1973, the Wildlife Code of the State of Florida and the State of Florida Panther Act of 1978.

Since 1981, the Commission has documented the natural history of panthers through radio-telemetry. Trained hounds trail and tree selected panthers, then a veterinarian tranquilizes the cats so that biologists can attach collars that transmit unique radio signals. By plotting individual panther locations, biologists document habitat use, daily activities, home-range size, social interactions and other details that are important to understanding the requirements of this rare animal. This information is



GFC

Florida panther tracks show a distinctive three-lobed pad. The claws are usually retracted and leave no marks.

necessary to design important recovery strategies to secure the existing population in South Florida.

Another major objective is to reintroduce the Florida panther into suitable areas within the subspecies' historic range. This will allow the panther to increase its distribution and numbers in the wild, reducing the risk of extinction. Studies already have begun in the Osceola National Forest/Okefenokee Swamp to evaluate the area for its suitability as a Florida panther release site.

A captive breeding program for Florida panthers has also been implemented this year. The purpose of the program is to bring into captivity representative individuals from the wild population for selective breeding to expand their numbers. This program will allow us to enhance the genetic and demographic structure of Florida panthers in captivity and produce healthier stock for management of the wild population and for reintroduction.

In 1991, only kittens will be brought into captivity. So far, three male kittens and one female kitten have been captured. Researchers plan to catch two more female kittens this spring. Gilman Paper Co., at its White Oak Plantation near Yulee, has constructed a captive breeding facility for Florida panthers where the first kittens are being cared for. Three other facilities that will soon participate in the program are the Miami Metrozoo, Lowery Park Zoo in Tampa and the Jacksonville Zoo.

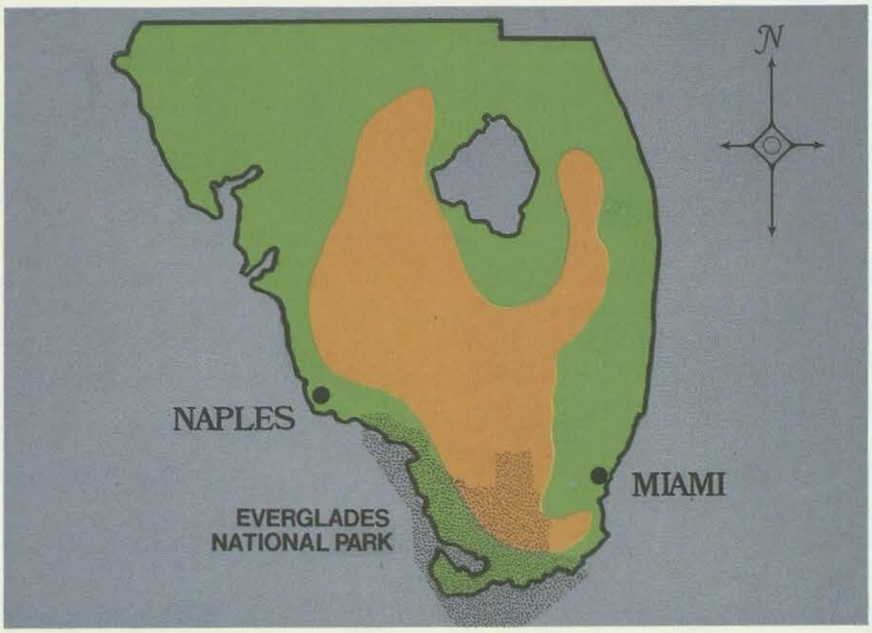
The Florida panther, without human intervention, is caught in a slow but certain extinction process. Genetically, the population numbers are critically low. Habitat preservation, captive breeding, reintroduction and other management actions should reverse this process by increasing population numbers and improving vitality in individual animals as well. The survival of the Florida panther depends on public understanding and support and the ability of individuals, organizations and agencies to work together.

Because of the panther's low numbers, some rather radical and artificial management measures may be required. These may include relocating individual panthers among populations, moving them in and out of captivity, and introducing them into new areas of unoccupied habitat. A well-coordinated and supported effort is needed to continue with the progress we have already made toward recovery of the Florida panther. Not only will these efforts enhance the probability for panthers to remain a part of Florida's wildlife community, the same efforts, especially those that result in protection of the natural areas essential to panther survival, will also contribute to the health of our environment and continuing quality of life in Florida.

What Can You Do To Help The Florida Panther?

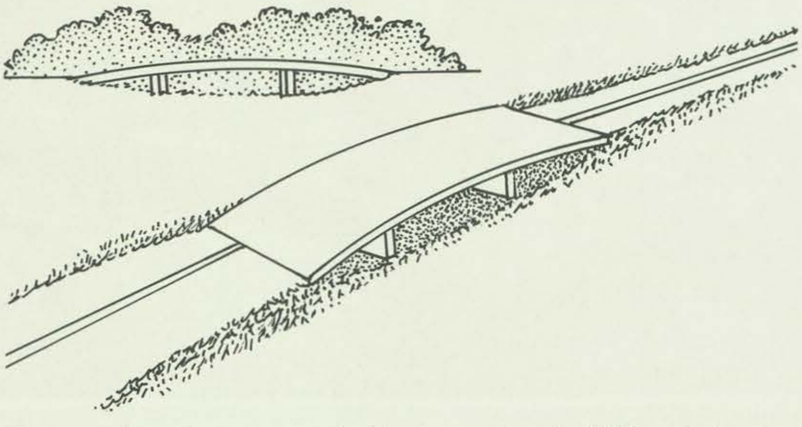
The Florida Panther Research and Management Trust Fund enables Floridians and other interested individuals and organizations to take part in a massive research and management program to help save the panther.

Persons who would like to contribute to this fund may send tax-deductible donations to the Florida Panther Research and Management Trust Fund, c/o the Florida Game and Fresh Water Fish Commission, 620 South Meridian Street, Tallahassee, FL 32399-1600. Checks should be made payable to the Florida Game and Fresh Water Fish Commission, but should bear the notation that they are for the panther trust fund.



CLARK FRAZIER

Known Florida panther range.



Documented panther routes resulted in construction of wildlife underpasses.

Life History

Florida panthers breed primarily in the winter, with females giving birth 90-98 days after conception. Litter size ranges from one to four, with two being the most common.

Panthers enter the world as shut-eyed, 14-ounce kittens, usually born deep within the protecting fronds and barbs of a palmetto thicket. Panther kittens are gray with dark brown or blackish spots and have five bands around the tail. The spots fade and are almost unnoticeable when kittens are 6 months old. After four months, their bright blue eyes slowly turn to the light-brown, straw color, like adults'.

The helpless young remain at the den for up to two months while they develop the strength and coordination to travel. During the denning period, the adult female periodically leaves her kittens, traveling several miles and for up to 36 hours before returning. These temporary separations allow the female to hunt, feed and maintain milk production for her growing litter.

At about the time they leave the den, kittens are weaned, feeding solely on kills made by their mother. Through play and early kill attempts, the kittens hone their own predatory instincts. Florida panther kittens remain with their mothers for 12 to 18 months before dispersing up to 50 miles from their birthplace.

Home ranges are over 200 square miles for adult male Florida panthers and between 50 and 100 square miles for adult females. Because panthers are large, solitary carnivores at the top of the food web, they require large ranges to obtain the necessary prey to meet their energy needs. Also, their social and reproductive behavior requires access to large, contiguous areas of suitable habitat in order to maintain viable breeding populations.

David S. Maehr is the head of the Commission's panther research program in South Florida involving wild Florida panthers. Chris Belden is in charge of research involving the captive breeding and reintroduction of Florida panthers. He works at the Commission's Wildlife Research Laboratory in Gainesville.

A young male Florida panther.

DAVID S. MAEHR

Florida's Stinging Caterpillars

Text and Photographs by James Phillips

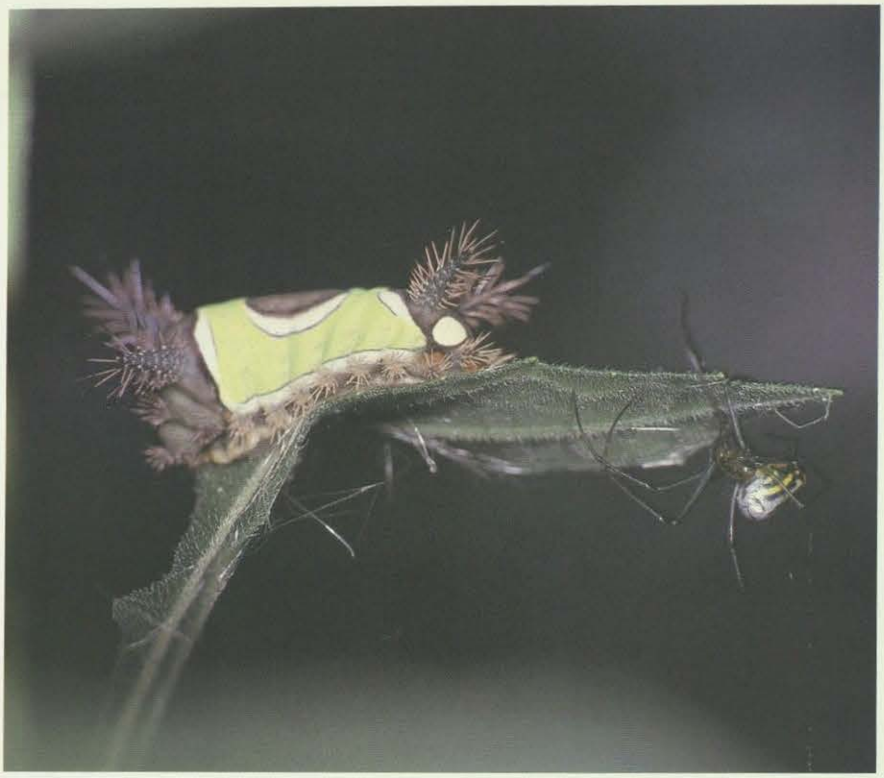
Florida is home to at least four species of stinging, or urticating, caterpillars. They range in appearance from the uncharismatic puss caterpillar, which resembles a pill rolled in lint, to the menacingly beautiful IO moth and saddleback caterpillar. A fourth species, the buck moth caterpillar, is related to the IO, but is less often seen in Florida.

A close encounter with one of these small creatures may leave you with the impression that you have been singed by the dragon's fiery breath. The hollow, venom-laden spines easily pierce human skin and result in an excruciating wound. After one of these painful experiences, you may find that some spines have broken off and are embedded in your skin. These may be removed with adhesive tape and followed with the application of an ice pack to relieve the pain. Antihistamines may also provide some relief.

The stinging spines are just one of a variety of weird protective mechanisms that have evolved in caterpillars, such as their resemblance to twigs or bird droppings. Some have adapted to life underwater and possess gills. Others build large "tents" and live in colonies. Butterfly caterpillars are the more benign, frequently depending on fearsome looks, bitter taste or sharp spines and hairs for defense. What distinguishes the stinging caterpillars (all of which become moths when they mature) is that they actually have venom glands at the base of their spines. Only these caterpillars are capable of injecting venom into unwary and even unintentional antagonists.

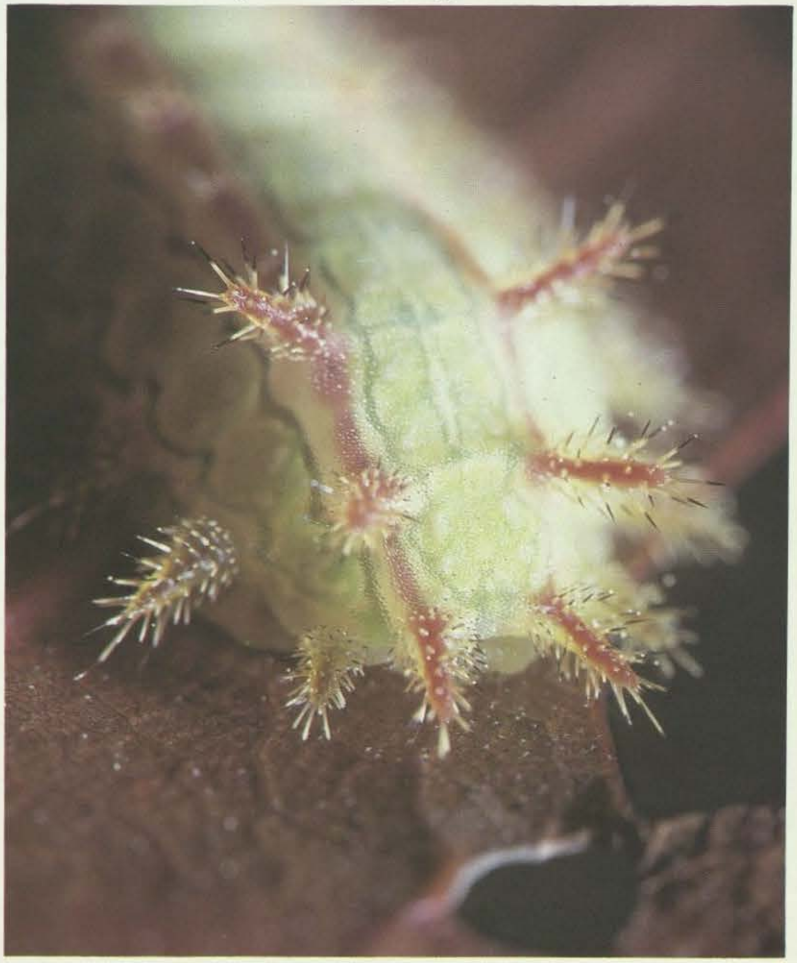
The glands secrete a chemical found in the venoms of many wasps and spiders, called 5-hydroxytryptamine or 5-HT. To most people, contact with this toxin is a painful annoyance. For the terribly allergic, a brush with any venomous insect may result in a trip to the hospital.

These amazing little "dragons" are most commonly found from March to December and inhabit a great ▷



Page 19 and above: Saddleback caterpillar, above with maple orchard spider.

An IO moth shows its front-end spine array.



variety of foliage. They are often found on oak or sweet bay leaves and sometimes even on garden roses. Your best protection against being stung is simply to learn to recognize and avoid them. However, don't be too surprised if someday you feel the breath of a dragon on your arm. The big sting may have come from the beautiful little caterpillar on the bush you just brushed against!

Florida's saddleback caterpillars are like little, green Chinese dragons festooned with hypodermic needles.

Photo Tips

For photographing subject matter of this sort, I generally use a Canon T90 and a 100mm f2.8 lens with extension tubes or use other lens combinations. In order to achieve a greater magnification for these photos, I modified two lenses. Although I used Fujichrome 50 for most shots, Fuji's new Velvia slide film would be a better choice in most cases.

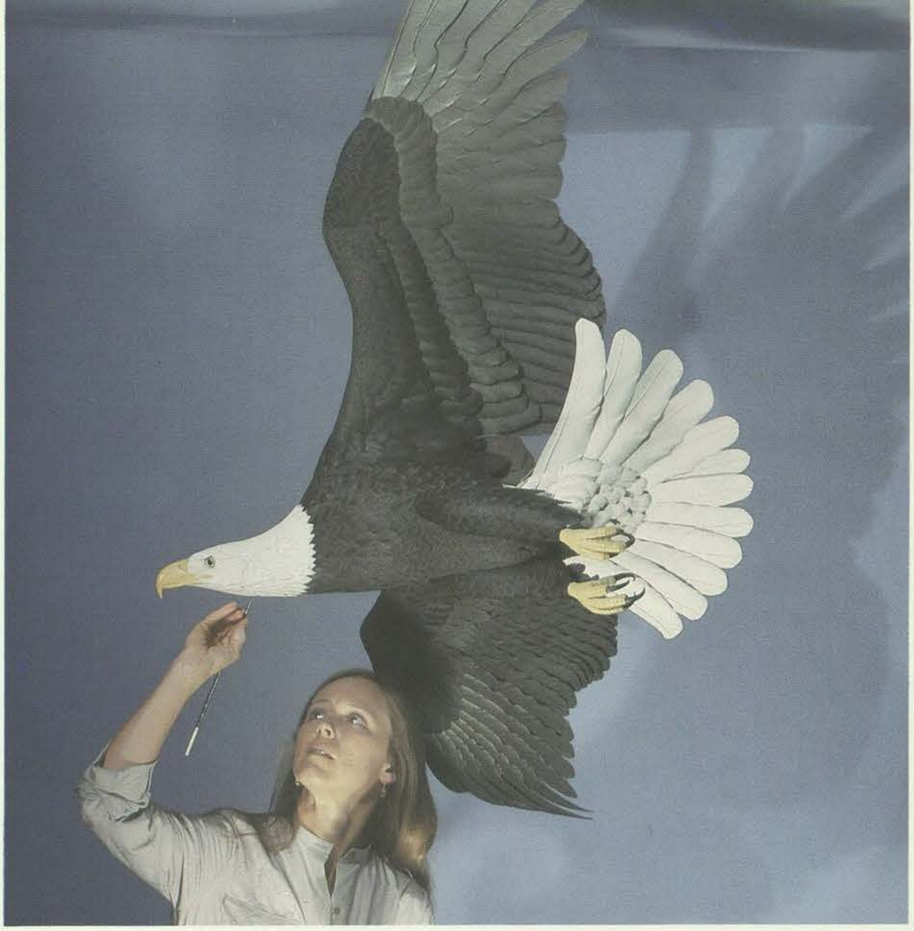
Obtaining sharp images with ambient light is terribly difficult at these magnifications, even with sedentary subjects. I prefer to use one or two small flashes.

One of the best primers on the use of flash may be found in John Shaw's wonderful book, *Nature Closeups*. In it he describes a homemade apparatus called a "butterfly bracket," which you may find invaluable.

As with all closeup photography, depth of field is problematical. The greater your image is magnified, the less depth of field you have. To maximize depth of field, use the smallest f-stop available, and focus by moving the camera back and forth.

And always focus on the eyes — presuming it has 'em, that is.

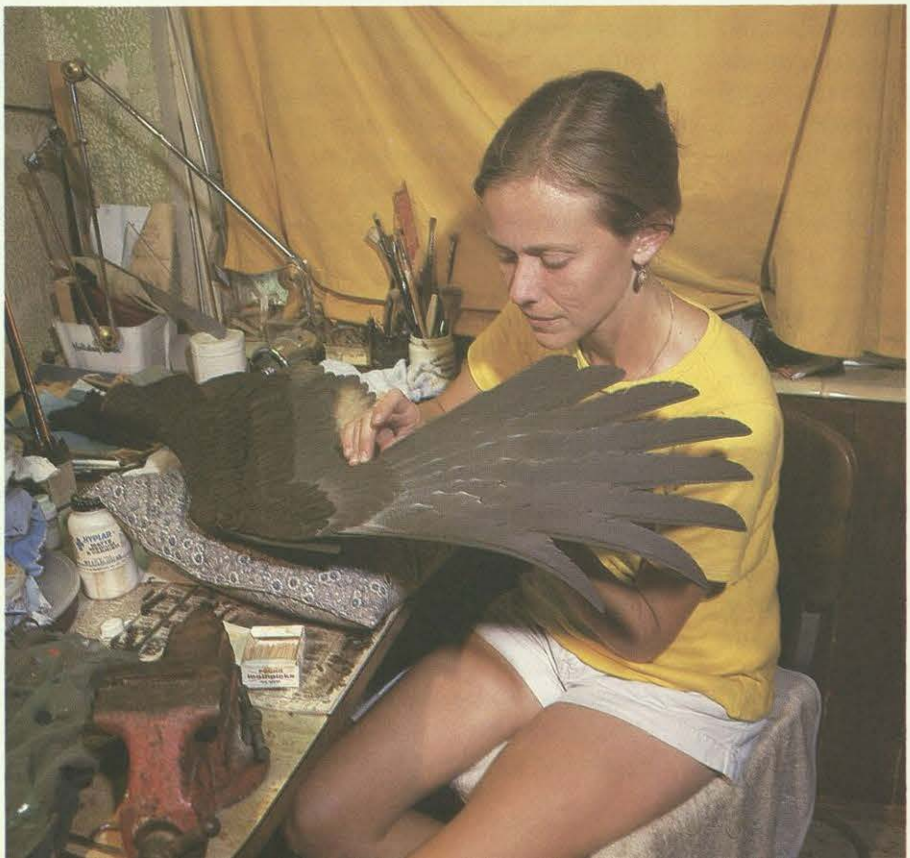
James Phillips owns Silverlake Photographic Services in Tampa.



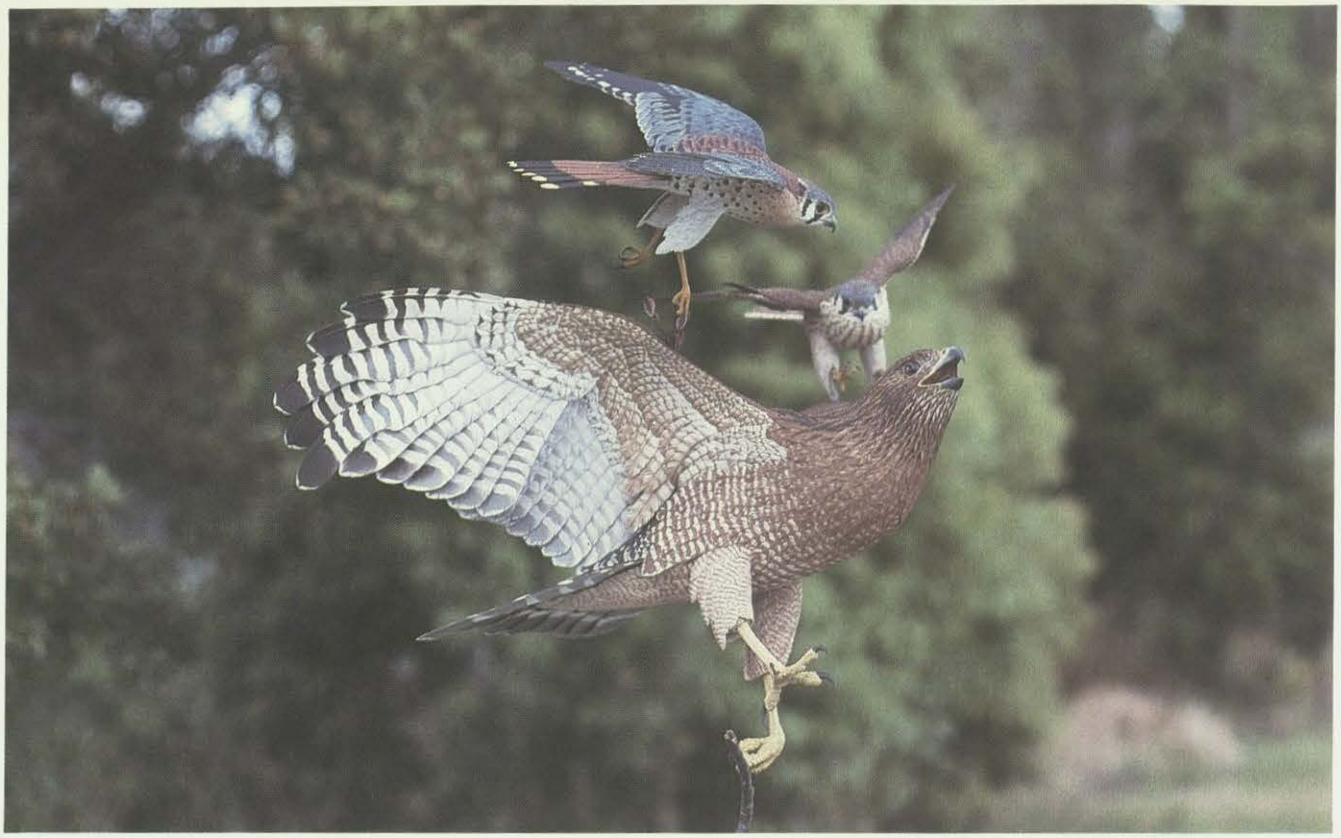
Lynn Hannon

She Makes Birds Fly

Text and Photographs by W. Horace Carter



▷



The artist worked almost three years to create the bald eagle pictured on page 21. She enjoys the challenge of expressing the complex action of birds' flight patterns for her sculpture.

Even a trained eye mistakes her sculpture for a taxidermist's mount. Sometimes, a viewer expects it to fly. While perfection of detail distinguishes fine wildlife art, the essence is the depth of the artist's expression. And it was the flight of birds that set fire to Lynn Hannon's imagination and gave her a powerful medium of artistic expression.

This artist was almost a fifth-generation Floridian. Instead, she grew up on her parents' ranch in desolate Texas hill country, without television and with only a smattering of radio to keep them posted on weather and world news. For entertainment, her family fished the nearby Blanco River and hunted projectile points and fossils in the limestone cliffs of that rugged countryside. She lived every day outdoors.

"You can accurately say that I grew up in the woods," the friendly Odessa artist said.

"My mother's love for birds, animals and plants and her extensive knowledge of nature influenced my life. When I began to paint, it was just a lark because my first love was the piano," Ms. Hannon said.

"I enrolled at Tulane University, took a few art courses and was told that I should pursue that talent. Then I married Douglas Hannon, a transplanted Canadian. While visiting my parents in Texas, he became obsessed with largemouth bass. We moved to Florida, my ancestral home, and settled on Keystone Lake, near Tampa at Odessa, so that Douglas could fish and study. In time, he became widely known as the 'Bass Professor,'" she said.

Douglas Hannon wrote *Big Bass Magic* and three other books about largemouth bass fishing, and has written hundreds of articles for regional and national magazines.

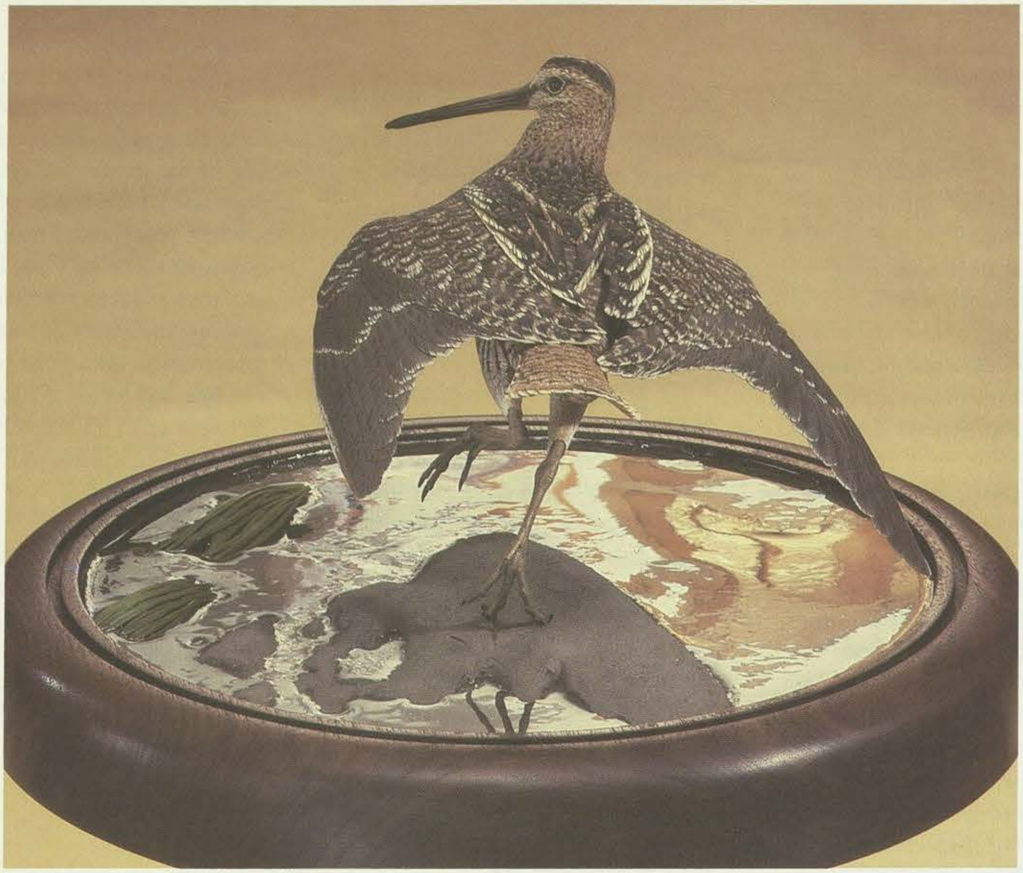
Lynn Hannon accidentally stumbled into wildlife sculpting during Christmas 1972. She ordered two duck decoys as gifts, but when they arrived, she was disappointed in the crude birds. She went to work on them with a pocket knife. Douglas, admiring his wife's efforts, bought her a $2 set of gouges. Soon, the artist was ordering her own basswood and working 12-hour days. So it began, and she hasn't stopped yet. Being her childhood love and inspiration, birds were a logical subject for her work.

"It almost seems like the birds searched me out rather than the other way around," she said.

The most compelling and obvious bird characteristic is their flight. It's that action that expresses the spirit of what is truly wild.

"For me, art is communication between the wordless portion of an artist's soul and the viewer's imagination. Flight became the focus of my work because it provides me with the means for this communication. It is a complex concept, and in birds it is a complex action. Expressing living flight in a rigid material like wood requires understanding that extends beyond the woodworking technique. The latter takes time and practice; understanding demands love and vigilance," she said.

"I read everything in the library on bird flight, aircraft and



Ms. Hannon's sculpture of a common snipe.

aerodynamics, but my best lessons came from hours of field observation. I learned the motions of living wings and the unique flight limitations and advantages of each species. This visual knowledge gave me a much deeper understanding of flight than any words or pictures could describe.

"I don't think you ever really 'arrive.' There's always more to learn, farther to go, and the road gets longer instead of shorter the more you travel it," she philosophized.

In the mid-'70s, carving was done primarily by older men who made decoys. A few birds were sculpted, notably by Gilbert Magionni and Grainger McCoy, now legends in their field. She met Magionni and McCoy when she began exhibiting her sculpted birds in Salisbury, Md.'s prestigious carving show. Both artisans praised her work and encouraged and advised her. Her correspondence with these two artists was pivotal in her career. It was an inspiring time for the young wildlife sculptor.

"In those days, there was sort of a sad, paranoid defensiveness among many artists, an attitude that someone was trying to steal their secrets. Gilbert and Grainger were just the opposite — they gladly shared their secrets. That has always been my attitude. There's an incomparable joy in helping other artists, and it is one of the most rewarding accomplishments in my life. To me, it's fun.

"This open attitude of sharing secrets and knowledge is probably why I avoid competition. We're together in a pursuit that's difficult enough without pitting us against each other.

"My work has become increasingly complicated and time-consuming. The last four pieces I sculpted required six years of hard labor. My largest work is a bald eagle 35 inches long with a 75-inch wingspan, in flight. After months of drawing and study, I worked almost three years and more than 8,000 hours to carve it, starting with three rough blocks of wood.

"The legs on my birds are usually metal that I cast in the lost-wax process. Along with the wood and wax, I also work with steel, brass and copper for the various structural supports of the habitats in which I place my birds. I learned about glass blowing to make the eyes of my birds. These brought me in contact with many interesting and skilled professionals to whom I am indebted," Ms. Hannon said.

Not a traditionalist, she is now exploring plastics for use as parts of her birds. She is not locked into using wood or hand tools exclusively. She exercises her options.

"An artist is always exploring, trying to see beyond the frontier. He needs to travel light, unencumbered. This requires an open mind that refuses to limit itself, because an artist can't afford to hang onto any technique or material that isn't the best possible for his purposes. Michelangelo would have been excited about power tools!" she said with a laugh.

"It's results that count. It's what the viewer who knows neither me ▷

nor my methods sees at the end of my effort. The finished piece becomes more important than I am. I'll be dust before it is," she said.

The artist has exhibited her sculpted birds in international shows, including the "Birds in Art" exhibit at the Leigh Yawkey Woodson Art Museum in Wisconsin. Her work was in company with that of the world's most famous wildlife artists: Guy Coheleach, Robert Bateman, Roger Tory Peterson and Arthur Singer, among others.

"Most important," said Ms. Hannon, "is simply knowing your subject. I watched bald eagles resting in the trees in our yard and flying over the lake for years. Observing birds and reading everything I could find makes the piece work. An intimate knowledge of the subject is my best tool. I can take that knowledge and move wings and bodies in imaginary air to create an impression that is expressive, exciting and beautiful," Ms. Hannon said.

Ms. Hannon's work was in company with that of the world's most famous wildlife artists.

Yet, while this talented artist credits her knowledge of flight and life-long love affair with birds for the realism in her work, it's her hands, tools and mind that create magic from wood, a paper drawing and a styrofoam model.

Lynn Hannon's work is always one of a kind. She never copies a piece. She, too, is one of a kind. While she enjoys sharing her expertise, there are no pupils on the horizon whose work compares with her detailed perfection. She seems living proof that great artists are born to succeed.

[**Editor's note:** Friends of Florida Artists, a not-for-profit organization, recently commissioned a limited circulation print of Hannon's eagle. Proceeds from the sale of the prints will go toward the purchase of the eagle, which the group's president, Steve Whalen, hopes to place in Washington, D.C. as a memorial to soldiers serving in Operation Desert Storm. For more information about the prints of the Friends of Florida Artists, contact Whalen at 7716 Van Dyke Rd., Odessa, FL 33556; (813) 920-2940.]

W. Horace Carter is the author of 12 nonfiction outdoor books and more than 2,000 magazine articles. Carter founded the ***Tabor City Tribune*** *and has served numerous terms as president of the Florida Outdoor Writers Association.*

The artist created a life-like quail sculpture.

Florida's Steepheads: Unique Canyonlands

By D. Bruce Means, Ph.D.

Florida's dramatic canyon heads may drop 100 feet.

What do a doodlebug and an hour-glass have in common? They both make a conical depression in sand. Watch a perfectly conical depression form as sand moves down the neck of an hour-glass. The doodlebug creates the same type of conical depression when it flicks sand up and out of its ant-trapping depression.

Now envision what the conical depression might look like if the bug were to flick sand as it moved horizontally just under the surface of the sand. Its track would form an elongate depression. It would continue to elongate until the track ended, leaving a half-conical slope where the doodlebug stopped its motions. The elongate depression and its semicircular head are important in understanding a unique type of Florida's small-stream ravines.

Now visualize a scaled-up version of such an elongate depression running through some of Florida's sandiest terrain, ending in a gigantic amphitheater 50-100 feet deep. ▷

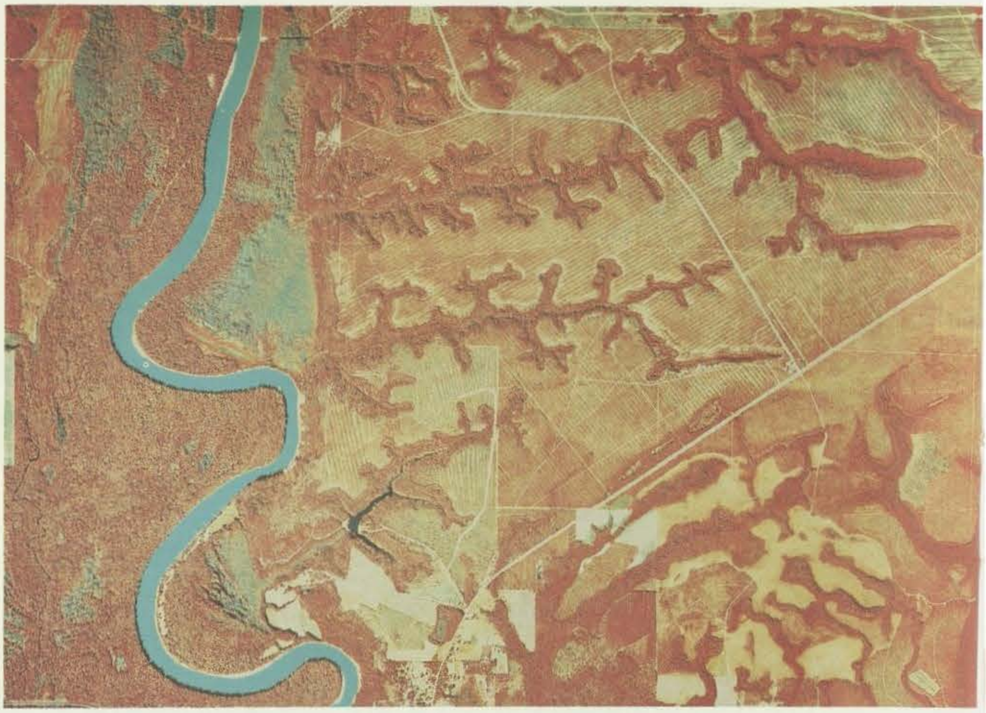
D. BRUCE MEANS

Springwater gushes from the base of the conical half-circle. This springwater carries away the sand it gushes through, grain by grain. The springwater removes the sand like a giant doodlebug does; however, instead of flicking the sand high into the air, the springwater carries it down the elongate depression in a stream formed by the springwater.

As the springwater removes sand from the base of the slope, it undercuts the sand reclined on the slope of the steep-walled amphitheater, causing sand to slump down into the emerging springwater. Since water can flow through the sand, this newly deposited sand soon is carried away and the slope gets undercut, slumps, and is carried away again. In this manner, the steep-sided head of the valley continues to migrate headward. It moves in the direction that a giant doodlebug might be crawling and flicking — or in reality, in the reverse direction from which the water flows out of the sand.

I fell in love with these exquisite, sandy valleys when I first began studying Florida's salamanders in the 1960s. Because these valleys are deep, cool, moist ravines that certain kinds of salamanders require, I soon learned how to look for the distinctive contour lines on topographic maps that reveal the presence of these unique valleys. I learned that their deep, steep-walled valley heads have a simple, descriptive name given them by the early settlers in Panhandle Florida: steephead.

Normally, deep, raviny, small-stream valleys are formed by the scouring action of water as it runs off over the surface of the ground. Florida has many gully-eroded ravine valleys in the clayey soils of the Panhandle's red hills regions and some along the central Florida ridge. For example, all of the ravines in Torreya State Park south of Chattahoochee are of the gully-erosion type. On the other hand, those ravine valleys that form the principal attraction of Gold Head Branch State Park near Keystone Heights and Ravine State Gardens in Palatka are true steephead valleys.



D. BRUCE MEANS

Steephead streams etched into deep sands along the east side of the Apalachicola River in Liberty County.

While both gully-eroded and steephead valleys are small-stream ravines, there are some significant differences between them. Most important is the nature of the water that forms each type of valley and flows in their streams.

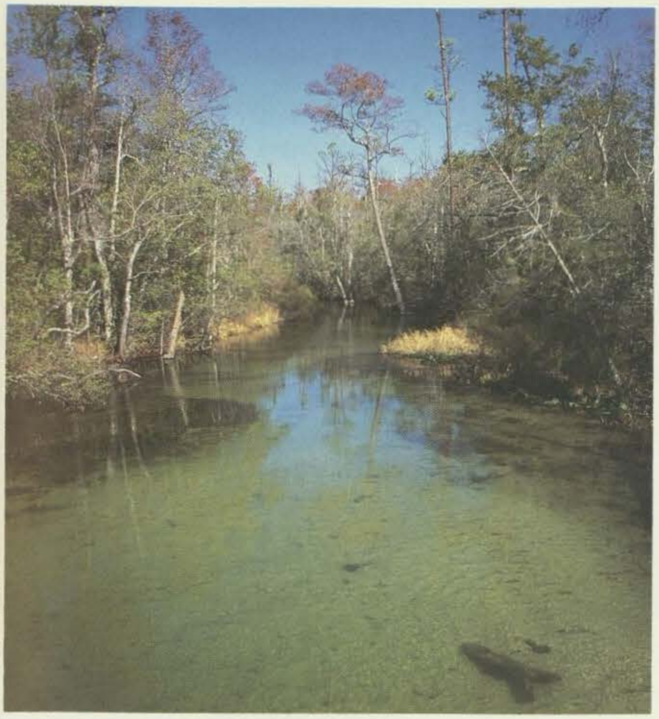
The flow of water in gully-eroded streams depends upon local rainfall. Heavy discharges of water surge down gully-eroded valleys after heavy rains. Likewise, during droughts, streams of gully-eroded valleys may dry up completely for months, as far as a kilometer or more downstream from the ridgecrest that marks the uppermost reach of the small drainage. Steepheads, by contrast, are ever-flowing, neither pulsing with high flows after rainstorms, nor drying up during drought.

The everlasting nature of steephead streams is very important to aquatic plants and wildlife that inhabit small-stream ravines. Several species of fishes including darters, minnows, guppies and creek chubs can be found year round only a few meters from where the streamwater emerges from the sand of the steephead. Several species of dusky, red and other lungless salamanders thrive in the continually soaked leaf litter that builds up along extensive seepage sites in steepheads.

Earthworms, springtails, minute crickets, crayfish, beetles, fly larvae, snails and myriad other invertebrates flourish in the same litter, supplying food on which salamanders survive. The seepage water escaping from the sand at the base of the steephead slopes has a constant temperature — approximately that of the average annual air temperature. Constancy of flow and temperature are but two of the important features of steephead streams that make them strongly different from their cousins, gully-eroded streams.

Water quality, too, is different because the waters of steephead streams are filtered through tons of sand and are chemically purer than gully-eroded streams, which can pick up surface runoff of nutrients and toxic chemicals from fields, roads and yards.

Visually, steephead valleys are markedly different from gully-eroded valleys because of the dramatic appearance of the steephead itself. Steepheads appear abruptly in otherwise flat or gently rolling, sandy terrain. When you stand on the upper edge looking



D. BRUCE MEANS

A large volume of seepage water originates in Florida's largest steephead, Boiling Creek.

Apalachicola dusky salamander. BARRY MANSELL

Okaloosa bog frog.

down, the bottom of the steephead valley can be 75-100 feet below you at a 45-degree angle. In the deepest steepheads it is possible to look down on the tops of tall hardwood trees growing up from the valley bottom — truly some of Florida's greatest physical relief.

Steepheads are found mostly in massive sand bodies that were deposited as huge, offshore barrier islands during the Pliocene Epoch. The onset of ice age climates about two million years ago saw these giant barrier islands stranded inland when the sea level lowered. Steephead valleys have been elongating into the ancient barrier islands ever since. The deepest and broadest steephead valleys are found on Eglin Air Force Base in Santa Rosa and Okaloosa counties and between Sweetwater Creek and Bristol in northern Liberty County. Tracing the barrier islands associated with the old Pliocene shoreline around the state, one finds other steepheads: Econfina Creek north of Panama City, Ochlockonee River along Lake Talquin and Trail Ridge inland along the northeastern Atlantic coast.

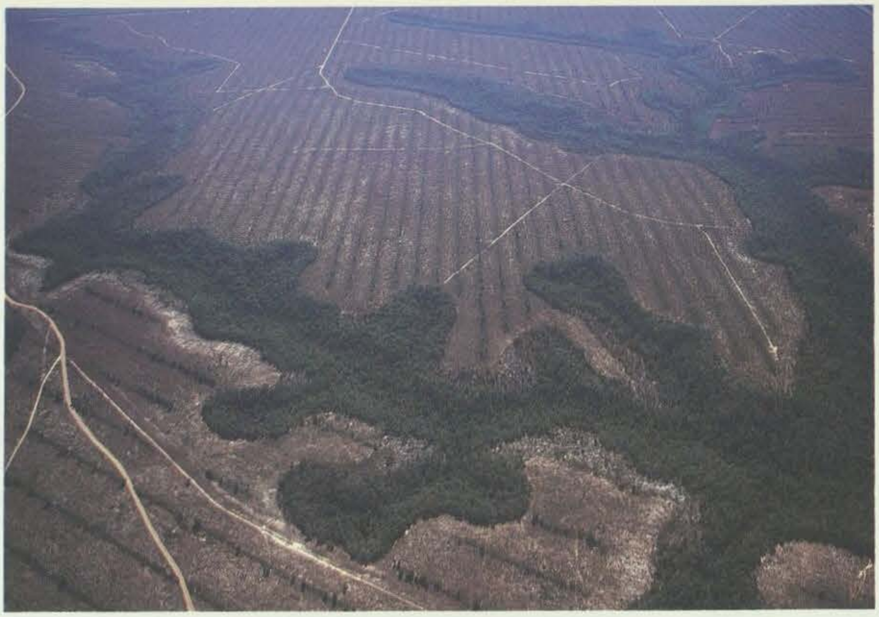
Steephead valleys are valuable as unique geological features and homes for special animals and plants. But they also are important to conservation because they contain at least four major types of ecosystems: the aquatic stream habitat; seepage-slope wetlands; moist, lower-slope hardwood forests of beech, magnolia, and many other tree species; and dry, upper-slope forests of laurel oak, liveoak, red cedar and other tree species. Steephead valleys, therefore, are composites of many different habitat types.

A century ago, if you climbed out of steephead valleys, you would have encountered a longleaf pine forest, the principal upland habitat of pre-settlement north Florida. Today these uplands are likely to be pine plantations, housing tracts or shopping malls. Going with the water down steephead valleys, one encounters a succession of aquatic and wetland habitats as streamflow increases and floodplain swamps develop.

Understanding the true value of steepheads lies in future research. To date, no published inventory of all Florida's true steepheads exists, nor have any studies inventoried either the animals or plants in steephead valleys to compare what lives in them with the inhabitants of gully-eroded valleys.

Last year, I chose a rather large steephead as the "type locality" of the newly named Apalachicola dusky salamander. I felt this population was less likely to go extinct from the collecting that often accompanies the naming of a new species. This particular population is less vulnerable to over-collecting than other populations that occur in gully-eroded ravines nearby because of the large size and physical constancy of the steephead environment. This and nearby steepheads are likely to be the only places where the threatened Apalachicola rosemary will survive the intense mechanical site preparation associated with tree farming on adjacent uplands.

Florida's newly named endemic bog frog and some populations of the Pine Barrens tree frog, both species of special concern are primarily found in steephead stream valleys on Eglin Air Force Base. These same valleys are important to two endangered species, the Okaloosa darter, which is found exclusively in steephead-origin streams (see "Delicate Balance," page 29), and many populations of ▷


D. BRUCE MEANS

The source of Big Sweetwater Creek in Liberty County has migrated through five miles of sand. Steepheads are at the ends of all branches.

the Panhandle lily. Eglin's steephead valleys also are home to rare and sensitive species such as Ashe magnolia, silky camellia, spoonflower and water sundew. Some of the more spectacular stands of old-growth Atlantic white cedar grow along Eglin's steephead stream courses.

The pure, potable water of steephead streams usually flows cool and crystal-clear. My favorite canoe outing is the outstandingly beautiful 5-mile-long run of Boiling Creek, a major steephead stream on Eglin Air Force Base, fed by some of Florida's most colossal steephead spring outflows. The best way to enjoy the clear-water stream is simply to body-float in the deliciously cold water, letting the canoe tag along behind with your lunch and dry clothes.

In springtime, you can drive a short distance north of Bristol to experience what I think steepheads are all about. Walk up under gnomish sand liveoaks fringing the edge of one of dozens of deep steepheads south of Sweetwater Creek and look breathlessly down into the shadowed ravine through the spreading boughs and deep greens of a closed hardwood canopy. Stepping forward, you go down steeply, each heel burying itself into soft sand; otherwise you'll pitch forward and tumble down a dangerous incline. Grasping the stems of small oaks and some vines, you can brake your descent hand-over-hand, but by midslope, the forest opens and the slope is paved with crinkly, light-brown beech leaves or leathery, rattling — and slippery — magnolia litter.

If you pick your path correctly, only a few more steps bring you to a seemingly impenetrable phalanx of evergreen mountain laurel shrubs, bedecked with masses of pink-and-white flowers. Pushing down and into this zone, you find the going easier if you squat or even slide down among the leggy stems of the bushes. Stop to admire wild ginger, crushing a leaf for the strong, root-beer odor it gives off. Near the bottom of the slope you have to step over the rotting trunks of small-diameter Torreya trees that have died in the past 40 years from a fungal disease that's bringing the species to extinction. You admire the yellow wood of this rare conifer, but snort at the pungent, irritating odor a pocket-knife slice of wood gives off. Reaching out, you touch the spindly stem of a live Florida yew and stroke the soft needles of this amazing, second species of conifer that is, like the Torreya tree, found nowhere else in the world.

At the very base of this steep slope, one last southern magnolia leans out over the wet, sandy, almost flat valley floor. Rooted in the black peaty seepage only a few inches below is a large sweet bay magnolia, a sure indication that you have quickly transferred from the upland slope to the wetland seepage of the steephead valley bottom. A dense grove of lanceolate-leaved, graceful stems lifts deep-red, quarter-sized flowers five to 10 feet over your head. The brusque, sweetish aroma of the crushed leaves incenses the thick air all around you, but a sniff of the primitive, red flowers of these star anise shrubs is a scent only a carrion-eater could love.

You find a log to sit on and look at the scene before you facing the very apex of the steephead valley. Tilting your head way back, you look up at the great sweeping arc made where the ground of the steephead gives way to the sky far above. Graceful boles of hardwood trees march by as your eyes scan down the slope to its very toe. There at the base of the slope is what makes this valley what it is. Out of pure sand, littered with multicolored leaves, flows crystal-pure water. In some places it doesn't just seep, but literally springs forth with a shimmering boldness. At once a 2-foot wide stream, 1- to 2 inches deep, gurgles forth.

Overheated and sweaty from your labors in the muggy air trapped under the double canopy of star anise bushes overtopped by hardwood forest, you are drawn to your knees. The water soaking your skin is quite cool. It takes the heat away from your hands. Leaning forward, you sip long and refreshingly from the sweet water. Looking up again, still on all fours, water dripping carelessly from your chin, you are certain you have just found what Ponce de Leon missed. At the very least, it is the end of the rainbow.

D. Bruce Means, Ph.D., is a professional ecologist serving as president and executive director of the Coastal Plains Institute.

Delicate Balance

Species: Okaloosa Darter (*Etheostoma okaloosae*)
Florida Status: Endangered
Federal Status: Endangered

Darters belong to the Perch family of at least 130 named species and a number of scientifically undescribed species. Only three are large enough to be sport fishes: the sauger, walleye and yellow perch, none of which are native to Florida. The rest are commonly referred to as darters — very small fishes, usually shorter than 3 inches. Most darters dwell on stream bottoms, where they remain unnoticed by most fishermen. Darters are usually of interest only to jug-eared boys and scientists, who capture them with canning jars and nets.

Of the 16 species that inhabit Florida's waters, only four occur in the peninsula; the rest occupy creeks and rivers of the panhandle. About half of Florida's darter species are relatively rare within the state.

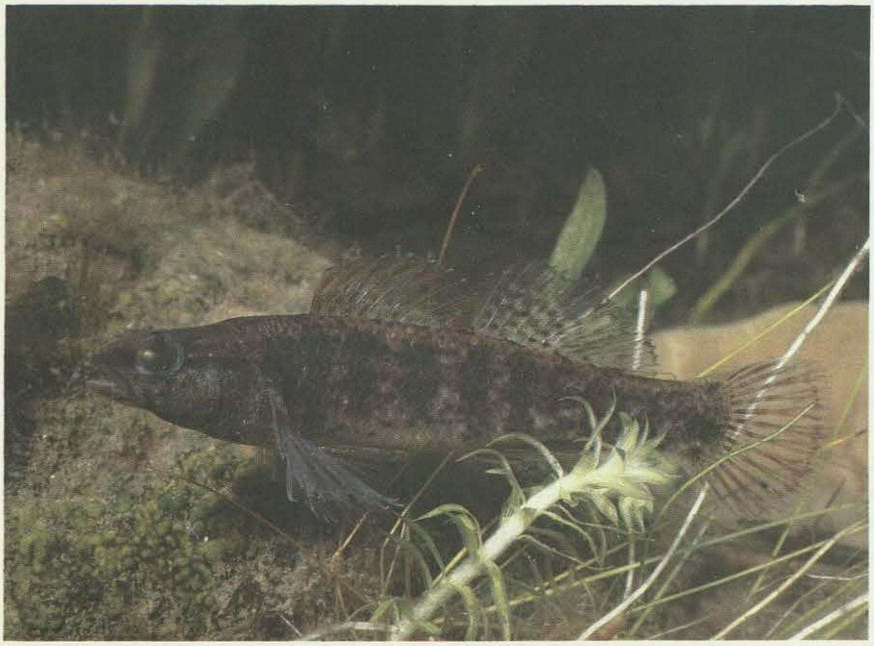
One of the rarest is the Okaloosa darter, occurring in southern Okaloosa and Walton counties and nowhere else on Earth. This unique fish occupies areas of aquatic vegetation in six small, clear-stream systems that flow into Choctawhatchee Bay. The entire range of this 1- to 2-inch fish is only about 100,000 acres. Bottom-dwelling aquatic insects, principally midge larvae, caddisfly larvae and mayfly nymphs, make up the bulk of the diet. Reproduction may take place throughout the year, usually with a major peak in April and a minor peak in September or October.

The primary threat to the continued existence of this species is the brown darter, a species native to north Florida, that invaded the Okaloosa darter's territory during the 1960s. The two species are closely related, with similar ecological requirements. Evidence suggests the brown darter is out-competing the Okaloosa darter, eliminating it from areas where both occur. No one knows whether the invasion of brown darters is natural, or if they were accidentally released with bait fish brought from other areas. Other threats to the Okaloosa darter include urbanization, land development and stream pollution. Fortunately, much of the darter's range is within Eglin Air Force Base and is largely protected from indiscriminate development.

Identifying the individual darter species is not an easy task, even for biologists. In general, darters are somewhat cylindrical in shape, with one or two spines in the anal fin. The dorsal or back fin is completely separated into a forward spiny section and a rear soft-rayed portion. The Okaloosa darter has a rounded tail and a slightly arched lateral line. The sides of the body bear five to eight longitudinal rows of dark spots. Body color is red-brown to yellow-brown on the upper portion and lighter in color on the lower section. Its close relative, the brown darter, is distinguished by its red spots on the body and fins.

Fishermen can help preserve rare species such as the Okaloosa darter by not releasing non-native baitfish.

— Gray Bass
Division of Fisheries



WILLIAM A. ROSTON

MARVIN CROY

Space Age Habitat Mapping

By Randy S. Kautz

Who would have thought that a satellite could help biologists identify Florida's vanishing habitats?

Florida's wildlife habitats are fast disappearing. In the past 50 years alone, Florida has lost 21 percent of its forests and 56 percent of its marsh lands. These once-productive wildlife habitats have been converted to citrus groves, pasture land, agricultural crops, urban areas, etc. As a result of the loss of so much habitat, many species of Florida wildlife are struggling for their very survival. For example, nine species of wildlife have disappeared from Florida since the arrival of European man, 56 species are now listed as threatened or endangered, and 44 percent of Florida vertebrates are thought to be declining.

Wildlife managers are well aware that we must protect the remaining high-quality wildlife habitats around the state if we are to save additional species from extinction. Before protection can begin, however, we need to know what kinds of habitat remain, how much is left, and where it is. In other words, we need an up-to-date map of wildlife habitats in Florida.

In the past, an accurate habitat map of an area as large as the state of Florida would have been nearly impossible to produce. Fortunately, however, we live in the Space Age and can bring new technology to bear on this problem. For the past few decades, numerous satellites have been launched into "earth orbit" to monitor events on Earth. One satellite, the Landsat Thematic Mapper, collects information that is especially well-suited to classifying and mapping vegetation.

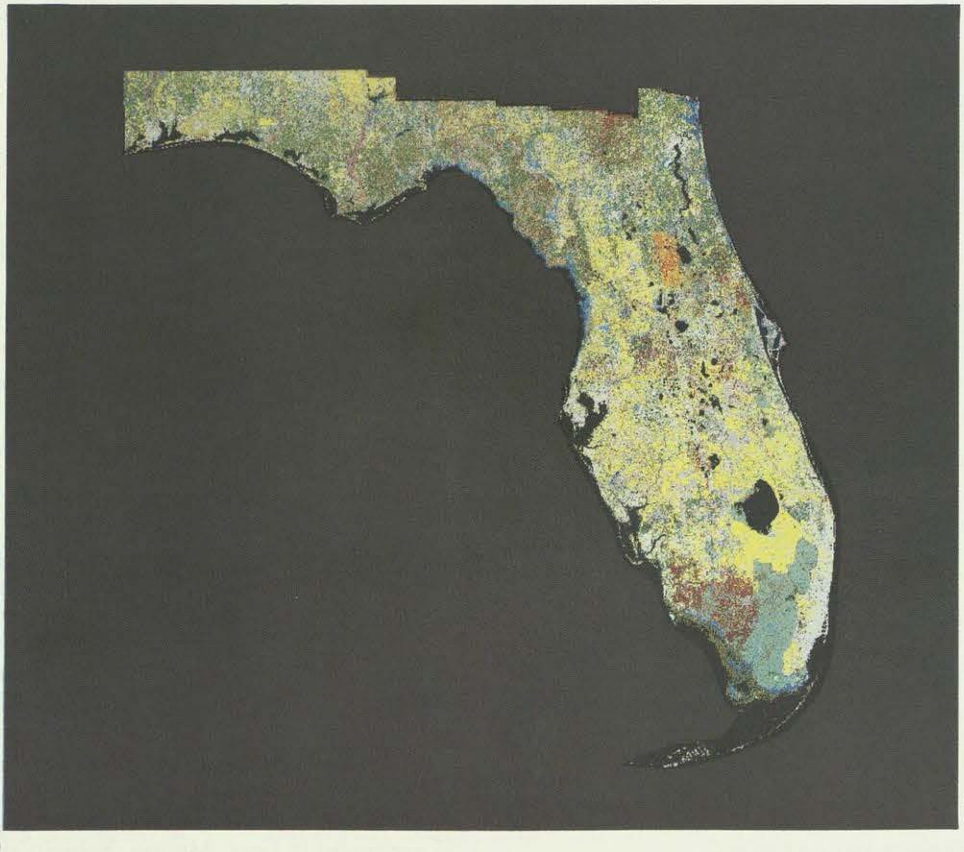
The Landsat satellite was placed into orbit 438 miles above the earth in 1982. Ever since, it has taken what amounts to a picture of each point on the earth's surface once every 16 days. Thus, there is a wealth of satellite data to draw on for vegetation mapping, and comparable data will be available in the future when it is necessary to see what changes have taken place over time. The resolution of the Landsat sensor is so fine that the information collected can be used to map vegetation in units as small as one-fourth of an acre. There are two major advantages to using satellite information for mapping rather than traditional aerial photo interpretation techniques: (1) satellite data is relatively inexpensive, and (2) it is in a digitized format that lends itself to rapid computer analysis.

Since the late 1970s, state agencies involved in remote sensing, land use planning and natural resource management have been

Table 1. Florida wildlife habitat types mapped using 1986-87 satellite imagery along with color codes for adjoining color map and acreages of each type.

Habitat Type	**Acreage**	**Color**
Natural Plant Communities		
Coastal Strand	13,280	Dark pink
Dry Prairie	1,385,952	Light pink
Pinelands	6,542,570	Green
Sand Pine Scrub	239,728	Orange
Sandhill	850,859	Light green
Xeric Oak Scrub	182,170	Red
Mixed Hardwood-Pine Forests	549,672	Brown
Upland Hardwood Forests	2,302,249	Light blue
Tropical Hardwood Hammock	15,253	Bright pink
Coastal Salt Marsh	485,320	Dark blue
Freshwater Marsh & Wet Prairie	2,706,786	Blue-green
Cypress Swamp	1,636,808	Brick red
Mixed Hardwood Swamp	1,908,891	Tan
Bay Swamp	157,216	Navy blue
Shrub Swamp	672,789	Dark gray
Mangrove Swamp	546,416	Olive green
Bottomland Hardwood Forest	89,744	Salmon
Natural Plant Community Subtotal	**20,285,703**	
Disturbed Lands		
Grassland & Agriculture	6,266,804	Yellow
Shrub & Brush Land	4,078,013	Light gray
Barren & Urban Land	4,146,322	White
Exotic Plant Communities	40,266	Dark purple
Disturbed Land Subtotal	**14,531,405**	
Upland & Wetland Total Area	34,817,108	
Open Water	4,279,762	Black

Landsat Land-cover Map



GFC

(continued on page 33)

▷

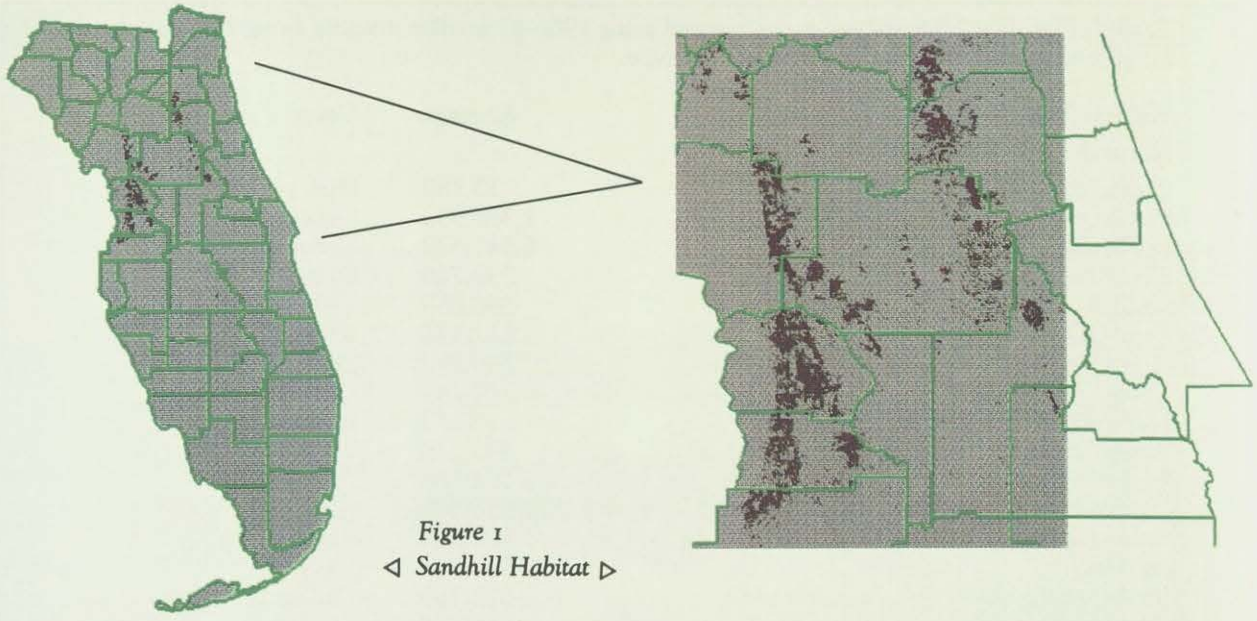


Figure 1

◁ *Sandhill Habitat* ▷

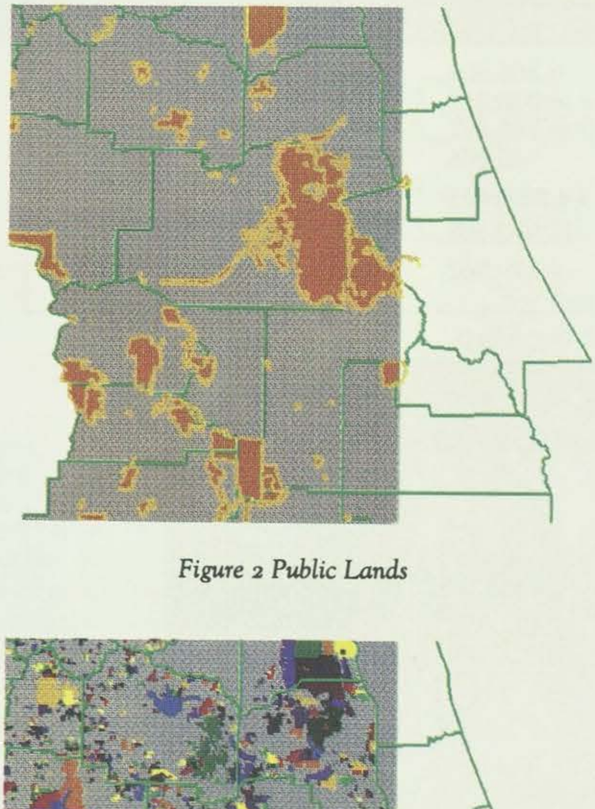


Figure 2 Public Lands

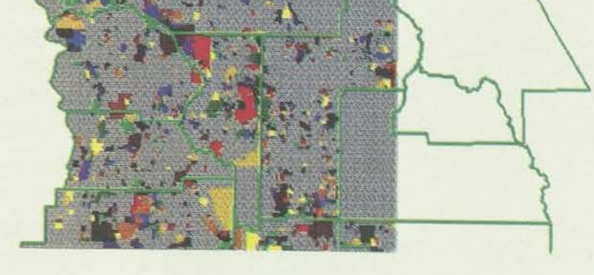


Figure 3 Private Lands

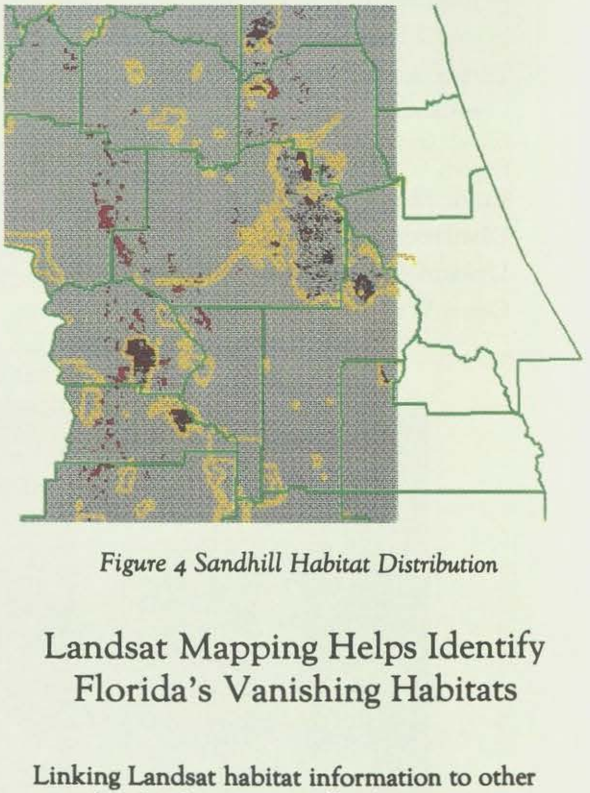


Figure 4 Sandhill Habitat Distribution

Landsat Mapping Helps Identify Florida's Vanishing Habitats

Linking Landsat habitat information to other geographical information will enhance conservation of valued natural resources. An example of such a linkage is shown here for an area of west central Florida. Figure 1 shows the remaining sandhill habitat (brown patches) in peninsular Florida. Sandhill communities contain a number of rare species and are dominated by longleaf pine and wiregrass. Figure 2 shows public lands (state forests, state parks, national forests, etc.), and Figure 3 shows large private parcels in the same area. These geographic data can be used to "cookie-cut" the Landsat information to show the distribution of remaining sandhill habitat on public (brown) and large private lands (burnt orange) in the region (Figure 4). Some of the important remaining tracts of sandhill habitat are found in Levy, Marion, Putnam and Clay counties.

aware of the potential for using Landsat satellite imagery for mapping vegetation. However, it was not until the late 1980s that the time was ripe to start such a project. With the advent of the Nongame Wildlife Program and a new source of funding, the Florida Game and Fresh Water Fish Commission solicited the help of the Florida Department of Natural Resources (DNR) and the Florida Department of Transportation (DOT) to produce a vegetation map of Florida using satellite imagery. DNR already had digital satellite imagery for all of Florida taken in 1986-87, and this imagery was lent to the Commission for the project. DOT's remote sensing section possessed the computer capability and expertise necessary to handle the large volume of data involved in the task. The Commission supplied the funding and assigned a full-time wildlife biologist to the project to aid in vegetation mapping, monitor progress, and ground-truth the resulting maps in the field.

One of the first issues to be resolved early in the project was determining the number of the wildlife habitat types that should be mapped. If all Florida habitat types were lumped into only a few categories, the resulting map would not contain sufficient detail to identify important habitats in need of protection. Likewise, if Florida habitats were divided into too many categories, classification decisions would be difficult, inaccuracies would increase, and the final map would contain more information than could be managed easily. As a compromise, project staff decided that the final map would depict 17 major natural plant community types, four categories of disturbed land, and one class representing open water. A list of the cover types mapped during the project, the resulting statewide acreage of each type and the corresponding color code appear in the table on page 31.

After three and one-half years of hard work, the statewide vegetation mapping project was completed in December 1990. The color map on page 31 depicts Florida wildlife habitats as they existed in 1986-87. The white, yellow and gray areas on the map represent highly disturbed lands. Together, these types cover 42 percent of Florida's landscape. These lands generally comprise poor quality habitat for wildlife. With so much of the state now in a degraded condition, it is no wonder that Florida's wildlife is in trouble.

Now that the habitat map is complete, we have answered our original questions of what kinds of habitat remain in Florida, how much is left, and where it is. The next step is to use the map to determine which of the remaining habitats are so critical that they need to be protected to ensure that no more species disappear from Florida or become endangered.

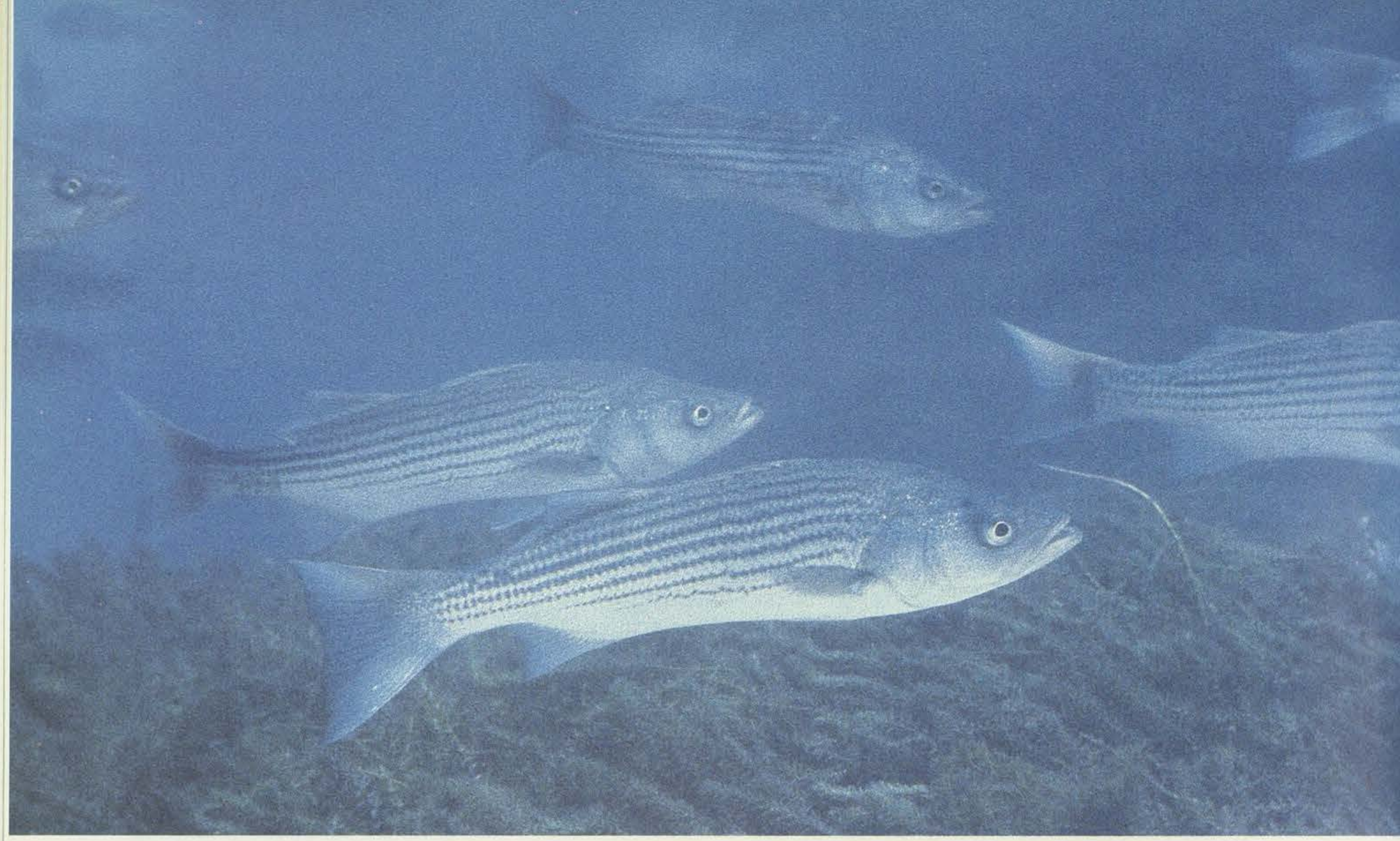
The Florida wildlife habitat map is the first of its kind in the nation.

To do this, wildlife biologists in the Commission are compiling information on known locations of sensitive species of wildlife and the habitat values of remaining patches of vegetation. Then, using a branch of computer science known as Geographic Information Systems, they are determining the value of habitats inside and outside of existing public lands. In this way, wildlife biologists can determine whether public lands are effectively protecting Florida's wildlife resources. They can also determine which new public lands should be acquired to meet the long-term conservation needs of the least protected species. Public lands include state and national parks, forests, wildlife refuges, reserves, preserves and lands owned by Florida's water management districts. This process is now underway, and the Commission expects to publish a map of all wildlife habitats in need of protection by July 1, 1992.

In addition to habitat protection planning, the satellite-based wildlife habitat map is in great demand for a variety of other uses. For example, county planners are requesting maps of the vegetation in their counties for use in developing comprehensive land use plans. Planners in the Florida Department of Community Affairs and in Florida's 11 regional planning councils use the habitat maps to aid their evaluations of the impacts of proposed large-scale developments. Biological consultants are asking for maps to improve their ability to site new facilities such as power lines, power plants, marinas and subdivisions in a manner that minimizes environmental impacts. This approach allows for producing better site designs prior to entering growth management regulatory processes. Commission biologists are finding the maps to be a useful aid for managing public lands and in evaluating the impacts of new developments on wildlife habitat. The maps have even been used in court cases to help protect important habitats under threat of development.

The Florida wildlife habitat map created by the cooperative efforts of DNR, DOT and the Commission is the first of its kind in the nation. No other state has ever attempted to use Landsat satellite imagery for a project of this magnitude. Although the map is not perfect, we are delighted at the overwhelming positive response. The number of data requests received daily is testimony to its usefulness. How fortunate we are to live in the Space Age, a time when information never before available is now at our fingertips.

Randy S. Kautz is the Nongame Habitat Protection Coordinator in the Commission's Office of Environmental Services in Tallahassee.



Murder Springs Eternal

Text and Photographs by Bob McNally

Below the placid waters of ponds, lakes and streams, murder springs eternal.

It is cold, calculated, well-planned, piscatorial mayhem — a first-degree felony, malevolent in all respects, and justifiably deserving of vengeance.

Every day, below that placid pond, tranquil stream or peaceful tidewater creek, there is a war of survival among those who eat and those who are eaten.

It is a never-ending, life-and-death struggle. Only the strong, the smart, the swift and the lucky survive.

In the underwater community of fish, there are enemies and allies. For most fish, daily life is a continuing mortal game of hide-and-seek.

Most anglers know this, but it was dramatically brought home to me one day while I was snorkeling in the clear waters of Silver Glen Springs Run, a spring-born feeder creek of Lake George.

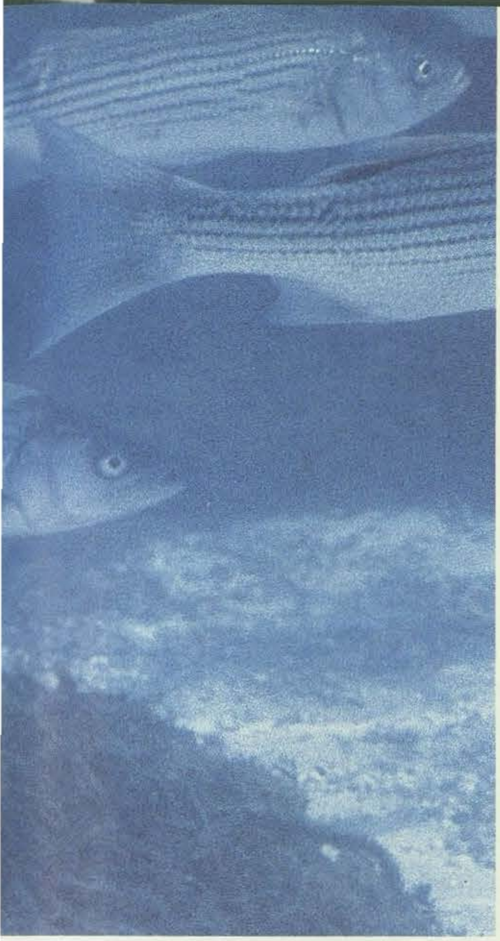
Silver Glen can be reached by boat from Lake George, located just south of the town of Salt Springs. I chose to drive to the spring, which is nestled within the Ocala National Forest off S.R. 19, and pay the $2 admission to enter. Silver Glen is a popular swimming, picnicking and snorkeling spot. No scuba diving or fishing is allowed in the spring "boil" area.

But, while most human fun takes place around the spring, below the surface, predators seek prey. The winners collect all the marbles, while the losers need not worry about tomorrow.

Walking along the banks, you can see a wide variety and abundance of fish, including striped bass, largemouth bass, bluegills, shellcrackers, mullet, shiners and tilapia in the main spring boils. But the best way to witness the spring's incredibly plentiful fish life is to don a mask and swim fins.

The main spring boils are close to the bank, so it's easy for even an average swimmer to observe fish by using a mask and fins. In fact, it's possible to stand in the water with your mask below the surface and watch dozens of fish as they go about their daily business.

During my summer visit to Silver Glen, the springs were jammed with striped bass. There were hundreds of them, stacked like striped cords of wood from the spring floor 30 feet below to the surface. They loomed like giant silvery-striped torpedoes and were remarkably complacent about the splashing and swimming all around them. When a snorkeler approached a school of 50 to 75 stripers, they allowed a close approach, then slowly turned and permitted the swimmer to ease



through without spooking them away.

Stripers are tightly schooled throughout Silver Glen because constant, 72-degree water bubbles up from the holes. Stripers must have that cool water to survive, so they seek out the spring during warm weather. Silver Glen is classed by fisheries biologists as a "thermal refuge" for striped bass.

I snorkeled among the stripers for hours, watching the schools nose down into the springs. Periodically they'd chase a small bluegill or shiner or ease up from the depths and cruise into the shallows. A few large, wooden posts and a dock's pilings attracted legions of stripers on the flats outside the spring hole. But the bulk of the fish remained deep in the cool, spring boils.

Once, while swimming into the shallows, I saw a big, 8-pound striper turn on its side suddenly and dart toward a large, slick rock. Time after time the striper rushed the rock, rolled on its side and brushed against it. At first I thought the striper had chased a baitfish under the rock. But that wasn't the case. The fish repeatedly scratched against the rock, for reasons only the striper knew.

Along the shoreline of the springs are thick beds of weeds. Dozens of large bluegills fanned their nests in the waist-deep water on the outside edge of the weeds. One particularly large male bluegill guarded his nest from all intruders, but was actively spawning with a pair of small, 2-inch-long female bluegills — the only fish he'd allow near the nest. When I approached the nest to photograph him, he became aggressive and nipped at my fingers.

For 30 minutes I observed and photographed the trio of lovesick bluegills, watching them bump each ▷

Both fish stayed nose-to-nose for several seconds, before the striper swam off, apparently realizing the bluegill was too big to become dinner.

other and swirl above the snail-shell-lined nest. But suddenly the two small female bluegills darted off into some nearby weeds and the large male bluegill turned his attention to the spring's depths. I turned, too, and saw a school of about eight stripers, none over 4 pounds.

One bold striper eased toward the bluegill's nest, and the spunky panfish met him head-on. They stayed nose-to-nose for several seconds, then the striper turned and swam off, apparently realizing the bluegill was too big to become dinner.

When the stripers disappeared into the depths, the two small female bluegills immediately came out of the weeds and began their courtship with the male bluegill again.

Several minutes passed, then the stripers returned. The small bluegills retreated to the weeds, the big bluegill stood ground over his nest, and the stripers soon left. When the coast was clear, out came the females again.

This same sequence happened five or six times, until one of the little bluegills made a fatal error.

The persistent striper approached the nest once more and spooked one of the little bluegills into the weeds. But the second bluegill, on the far side of the large male bluegill, didn't see the striper until the bass rocketed forward like lightning to inhale the fish.

The bottom sediment welled up and clouded the area for a few seconds, and even the big male bluegill was spooked off the nest. The strike was so quick, sure and deadly, that I let out a loud exclamation into the snorkel. I'm sure my scream of horror was audible to picnickers on the bank, who looked at me with raised eyebrows when I surfaced.

When the sand settled, only the striper loomed menacingly over the bluegill nest, slowly opening and closing its mouth and flaring its gills as it worked the hapless bluegill deep into its gullet. Then the striper turned toward deeper water and slowly disappeared into the spring abyss.

Once the bass had gone, the remaining female and male bluegills returned to the nest. Soon they danced their nuptial dance, as if the hapless, small bluegill had never existed.

Picnickers on the bank were not aware that they had been within a few feet of a murder, as deadly and as cold-blooded as it could be. There was no remorse below the surface either. No pause in the piscatorial order — only the reality of survival and the possibility of instant death.

Life, and death, continued unabated in the spring, just as they had, and will continue, for countless millennia.

[**Editor's Note:** Silver Glen Springs Run is open 8 a.m.-8 p.m. from April 1 through Oct. 31 and is operated by the U.S. Forest Service.]

Bob McNally is the outdoors editor for the ***Florida Times Union*** *newspaper and a regular free-lance contributor.*

Spring Slabsides

By Lt. Dewey Weaver

TOM EVANS

The first warm days of spring find me on a favorite north Florida lake searching for crappie. As I leave the boat ramp this morning, there is still a red tint of the sun on the horizon. The anticipation of catching giant crappie from the pads and grass beds lining the shore force me to motor past tree stumps, underwater fence lines and other areas that might hold fish.

During spring, I prefer to fish near maidencane grass beds, using a fiberglass pole, light line and live minnows. This morning, the first minnow that I lower into the water moves toward the protection of the grass when the float slowly drops below the water's surface. The strike produces a slabside crappie — a beautiful silver fish with black specks. I place the 2-pounder into the cooler, which I hope will contain several more before the day is over.

Black crappie are found in most natural lakes and rivers in the southern United States. The official state record is 3 pounds, 12 ounces caught by John McGilvray in Newnans Lake near Gainesville. This fish was not certified by today's standards, but the record is believed to be reliable based on witnesses. Florida's largest certified record crappie was 3 pounds, 8 ounces caught by Ronald Prevatt in Lake Dias in Volusia County.

A choice fishing method during winter is to drift live minnows in open water. Anglers usually fish several poles at varying depths until they locate crappie. Then they adjust their poles to the correct depth. In spring, when the fish move to shallow water for spawning, you can find crappie near grass beds, tree stumps or fence lines running out into the water. Once you locate spawning areas, fishing becomes fast and furious, and it's not unusual to catch the limit of 50 panfish.

On spawning beds, it's almost impossible to drop a minnow into the water and not get a bite. This is an excellent way to introduce children to fishing — young fishermen don't have time to become bored. Ideal water ▷

temperature for spawning is between 65 and 70 degrees. As the water gets warmer, the fish will return to deeper water and cooler temperatures.

When searching for spawning fish, look for moving vegetation that might indicate fish brushing the plants, or in very shallow water, look for small swirls on the surface as fish move around the bed. Old timers look for beds by "smelling them out" and swear by this method.

I have noticed a distinctive odor around not only crappie beds but those of other species of spawning fish. I don't know the source of this smell. It might be a male hormone released to attract the female to the bed, or perhaps it's caused by the release of fish slime in heavy concentrations. As far as I know, there hasn't been a scientific study to determine the source of the odor. The inoffensive, sweet, fishy smell is sometimes detectible from vast distances. If you drop a minnow-baited line you'll soon locate the source of the smell.

Another excellent crappie fishing method is to fish at night with a floating light or lantern. The lantern works best when hung just above the water. The light concentrates minnows and attracts crappie to feed. Fish with live minnows a couple of feet deep and near the outer fringe of light. This technique is great for fishermen who can't get away during daylight hours. It's also superb for a family outing, especially if you pack plenty of snacks and hot chocolate. Warm spring nights offer excellent fishing and relaxation under starry skies. Night fishermen don't have a lot of competition and on most nights will be in the only boat on the lake.

Although live minnows are my pick throughout the year, artificial lures also can be efficient. To locate large concentrations of "off-shore" fish, drop small jig heads with white plastic or feathered bodies around underwater tree stumps and fence posts. This is especially effective for "post spawn" fish that have moved back into open water. Crappie fishermen shouldn't pass up the Commission's fish attractors, located in more than 90 lakes throughout the state. These brush piles are built to provide cover for bait fish and to consolidate game fish into small areas. Fish with jigs or small spinners vertically in these areas to avoid snags. This also provides fishermen with more control of the lure and gives a better "feel" to the rod for detecting strikes.

Crappie bites can be very gentle and hard to feel. Watch the line for movement on the downward fall of the lure. Fish the jig just off the bottom by raising and lowering it, allowing the lure to drop naturally.

Night fishing for crappie is great for fishermen who can't get away during daylight hours. Warm spring nights offer excellent fishing and relaxation under starry skies.

Crappie are excellent table fare. I have found that placing fish on ice as soon as they are landed improves the flavor and helps make the soft flesh firmer. Crappies otherwise tend to become mushy, especially during the summer. Filleting the fish removes any strong taste that may be in the skin. I've never encountered this taste in crappie, but have noticed it in bass and bluegill. The cooked meat is flaky, very white and has a delicate taste.

My personal favorite cooking method is to fry the fillets to a golden brown in peanut oil. If you'd like to try other recipes, a fish chowder or grilled crappie fillets also are excellent.

When grilling fish, it's important to remember to use a fine mesh grill and to baste the fish with oil to keep the flesh moist. Scrub the grill clean, and prepare it with a coating of vegetable oil spray. A good formula to use in grilling fish is to cook them 10 minutes for each inch of thickness. Do not turn the fillets as this will cause the meat to break apart. On large fillets, always use two spatulas to take the fish off the grill.

Easy Fish Chowder

To make an easy fish chowder, assemble the following ingredients:

1 cup of fish flakes
1 can of whole kernel corn
1 can of cream of potato soup
1 can of whole new potatoes
1 can of sliced carrots
1 bell pepper, chopped
1 medium onion, chopped
¼ lb. bacon, diced
1 cup of milk

Saute the onions, bell pepper and bacon in a large pan. When the bacon turns brown and crisp, drain the grease and add the whole kernel corn, cream of potato soup, whole potatoes, sliced carrots and fish flakes. Cook this mixture for 30 minutes and add one cup of milk during the last 10 minutes of cooking. Add salt and black pepper to taste. This will make enough to feed a family of four and is exceptionally tasty on cold, winter days or around the campfire.

Back at the lake, more than 20 spring slabsides have taken the Missouri minnows I dropped by the maidencane grass. The action has been steady and, typically, the cork has rested only momentarily before being inhaled. The pole is bent almost double as the weight of the 2-pounder stresses the 4-pound test line. The fish darts around the boat, back and forth, before coming under control. I net the fish and stow the tackle. It's time to go for today, but I know that as long as we have clean water, there will always be spring slabsides to provide hours of recreation and hardy meals.

When he's not fishing, Lt. Dewey Weaver is the public information specialist in the Commission's Northeast region.

The Big Catch Program

By Mark Trainor

The Game and Fresh Water Fish Commission sponsors a new and improved "Big Catch" program that recognizes and rewards fishermen who catch unusually big fish.

The "Big Catch" program commends anglers for catching any one of 32 freshwater fish species meeting a minimum qualifying weight but not exceeding the current state record.

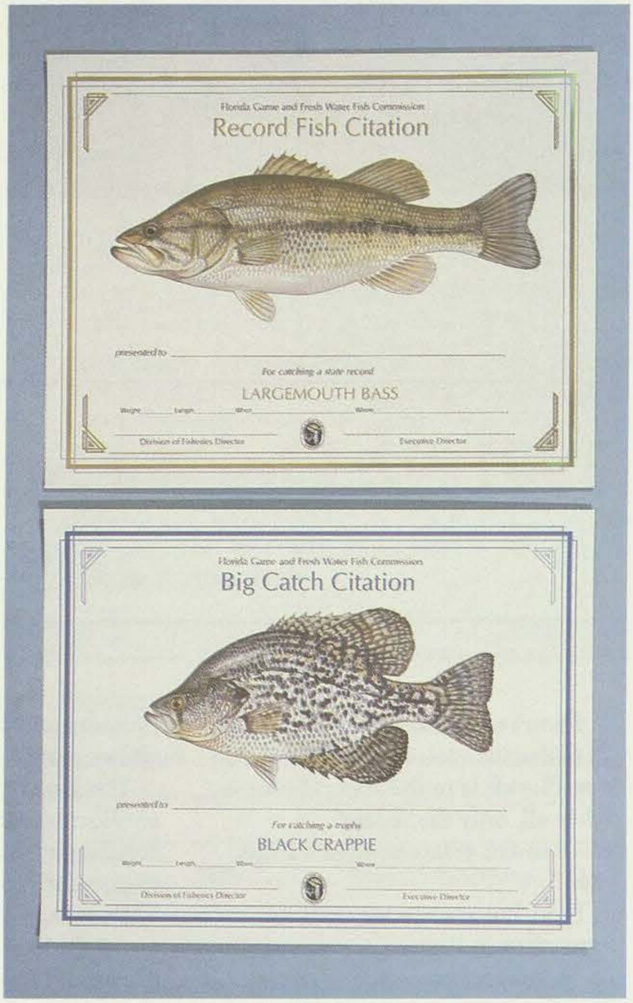
To qualify for Big Catch recognition: the applicant must have a valid Florida fishing license or be exempt under provisions addressed in the Freshwater Sport Fishing Guide; the fish must have been taken by a legal sport fishing method in the fresh waters of Florida; and the fish must be weighed on a public scale and measured with a witness present.

Once the application is approved, the angler's name is entered into the Commission's official records and the angler will receive a full-color Big Catch fish citation.

The citations will give special recognition to those who practice catch and release, returning their fish to the water unharmed.

Big Catch and State Record entry forms are available at tackle shops or any regional Commission office.

The eligible 32 freshwater fish species and their minimum qualifying weights are as follows:



Florida Game and Fresh Water Fish Commission
Record Fish Citation

presented to ____________________

For catching a state record
LARGEMOUTH BASS

Weight ______ Length ______ When ______ Where ______

Division of Fisheries Director ______ Executive Director ______

Florida Game and Fresh Water Fish Commission
Big Catch Citation

presented to ____________________

For catching a trophy
BLACK CRAPPIE

Weight ______ Length ______ When ______ Where ______

Division of Fisheries Director ______ Executive Director ______

Largemouth bass	10 pounds
Redeye bass	3 pounds
Spotted bass	2.5 pounds
Suwannee bass	3 pounds
Sunshine bass	8 pounds
Striped bass	15 pounds
White bass	3 pounds
Black crappie	2.5 pounds
Bluegill	1.5 pounds
Flier	12 ounces
Channel catfish	20 pounds
White catfish	10 pounds
Chain pickerel	4 pounds
Redfin pickerel	10 ounces
Florida gar	5 pounds
Longnose gar	25 pounds
Alligator gar	70 pounds
American shad	4 pounds
Redbreast sunfish	1 pound
Redear sunfish	2.5 pounds
Spotted sunfish	10 ounces
Butterfly peacock bass	5 pounds
Oscar	1.25 pounds
Skipjack herring	2.5 pounds
Warmouth	1 pound
Carp	25 pounds
Bowfin	10 pounds
Flathead catfish	20 pounds
Yellow bullhead	2 pounds
Brown bullhead	2 pounds
Black bullhead	2 pounds
Blue catfish	20 pounds

Watch for an updated list of state freshwater fishing records in the July-August issue.

Mark Trainor is a public information specialist in the Commission's Office of Informational Services.

Florida Waterfowl Stamp

Florida Turkey Stamp

1991-92 Florida Stamp Contest Winners

By Mary M. Davis

If you're not a sportsman or philatelist, you might think it odd that Florida is in the stamp business. After all, only the federal government prints postage stamps, right?

True, but stamps are used for more than indicating postage paid on letters and parcels. Each year, Florida issues waterfowl and turkey stamps, which are required for sportsmen who hunt ducks and turkeys within the state and are purchased by others interested in conservation. Philatelists also purchase the $3 waterfowl stamp and $5 turkey stamp for their collections.

By requiring sportsmen to purchase waterfowl and turkey stamps, the state measures interest and raises funds for habitat management. The state began issuing waterfowl stamps in 1979 and turkey stamps in 1986. Since then, more than $740,000 has been raised through the waterfowl stamp program and $500,000 through the turkey stamp program.

The stamp programs conducted by Florida, other states and the federal government have become important venues for wildlife artists. Each year, wildlife artists submit art for consideration by the Florida Game and Fresh Water Fish Commission.

For the 1991-92 waterfowl stamp, the five Commissioners and executive director selected a painting of northern pintail ducks by wildlife artist Richard L. Hansen of Cocoa Beach, Fla. Another painting by Hansen was selected for the 1991-92 Indiana Duck Stamp, as well. In the turkey stamp contest, the panel selected a painting of Osceola gobblers by Kathy Dickson of Poplar Bluff, Mo. Her art was selected as the 1991 National Wild Turkey Federation Grand National Print winner and for the 1991 Iowa habitat and trout stamp designs.

Hansen anticipates producing a limited edition of 1,000 signed and numbered prints of his winning artwork for sale to the public. At least a portion of the limited edition will be available with matching number stamps. In addition, an affordable "Sportsman's Print" edition including stamps with non-matching numbers is planned. For information, call toll-free 1-800-DUCK ART.

Ms. Dickson anticipates issuing prints of her winning design, as well. For information, contact her sponsoring gallery, Treasured Scenes Artistry, at 1-800-344-5921.

The 1991-92 stamps will be available in county tax collectors' offices as well as approximately 1,400 subagent locations on June 1. Stamps from the previous year are sold only by the Commission. Stamps from 1989-90 are available currently but will be destroyed June 30 when 1990-91 stamps expire.

1991 *FLORIDA WILDLIFE* Photo Contest

1. **Only original 35 mm slides and 2¼" x 2¼" color transparencies are eligible. Composite slides are not eligible. DO NOT SEND PRINTS, NEGATIVES OR DUPLICATE SLIDES. Print your name on the slide mount for each entry.**
2. **Enter up to three slides in any of the four categories. The 1991 categories are:**

   Category A — WILD BIRDS
   Category B — WILD MAMMALS
   Category C — WILD ANIMALS other than birds and mammals, including reptiles, amphibians and insects
   Category D — FLORIDA'S NATURAL ENVIRONMENT (the only category that may show people or man-made objects)
3. **Fill out an entry form for each category in which you compete. Photocopied forms are acceptable if signatures are originial. Be sure to circle the appropriate category letter for your entry. If people appear in your Category D entry, you must submit a signed model release form.**
4. **Entries must be accompanied by a self-addressed, stamped envelope for each category. Be sure to attach sufficient first-class postage (do not send money). Entries will be returned after winners are announced in the September-October and November-December issues.**
5. **Each slide entry must be attached to a 3" x 5" card with the photographer's name, mailing address, telephone number and Social Security number printed or typewritten on the card.**
6. **Only slides taken in Florida are eligible. Captive, domestic and exotic species are not eligible. Employees of the Florida Game and Fresh Water Fish Commission are not eligible. Only photographs that have never been published in a magazine are eligible.**
7. **Entries must be mailed to *FLORIDA WILDLIFE* PHOTO CONTEST, 620 South Meridian Street, Tallahassee, Florida 32399-1600 and must be received by June 28, 1991.**
8. **Any entry not meeting all the rules will be ineligible. Decisions of the judges will be final. Cash honorariums will be awarded upon publication.**

All entries will be handled carefully; however, the Florida Game and Fresh Water Fish Commission cannot be held responsible for lost or damaged materials.

Official Entry Form

CATEGORY: (Circle one) A B C D

Photograph No. 1 was taken in ______ County

and is of ____________________

Photograph No. 2 was taken in ______ County

and is of ____________________

Photograph No. 3 was taken in ______ County

and is of ____________________

Photographer: ____________________

Mailing Address: ____________________

City: ____________________

State: ______ ZIP: ______ No. of Entries: ______

Daytime Phone: (   ) ____________________

I certify that I am the photographer and owner of these entries (photographs) and that all entries were taken in Florida, and I hereby give the Florida Game and Fresh Water Fish Commission my permission to publish my entries in *FLORIDA WILDLIFE* in accordance with the contest rules.

Signed: ____________________ (Entrant)

Social Security Number: ____________________

Model Release

I, ____________________ (model's name), for good and valuable consideration, do hereby give ____________________ (photographer's name) and *FLORIDA WILDLIFE*, an informational and educational magazine published by the Florida Game and Fresh Water Fish Commission, an irrevocable right to use my name (and any fictional name) and photograph for publication in *FLORIDA WILDLIFE*. I have read this release and fully understand its contents. I affirm that I am 18 years of age or older.

Signed: ____________________

Guardian's Consent for Minor Models

I am the parent or legal guardian of the above-named minor and hereby approve the Model Release and consent to the use of said minor's name and photograph as aforesaid.

I affirm that I have the legal right to issue such consent.

Signed: ____________________

A Bio-Babble Primer

By Scott Hardin

Grab your newspaper or magazine and you'll see it. Global warming. Carcinogens. Ozone depletions. These are the banners of the Environmental Age. To be environmentally conscious, you have to speak the language: bio-babble.

Even fisheries and wildlife biologists are not immune to this craze. I dredged up this stupefying sentence from a report I wrote early in my career: "Although interrupted spawning due to cold weather may lead to a multimodal distribution in single year classes, it is more likely that largemouth bass in Lake Conway have had growth rates reduced by expending large amounts of energy pursuing pelagic prey in the absence of adequate sunfish in the littoral zone." Cleared that right up, didn't it?

I'm much better now. They don't let me write reports anymore. However, with my expert status firmly established, I hope to provide moral support for those who have found themselves alone and trembling, face to face with such horrifying terms as "reciprocal Morone hybrid" (a cross between white and striped bass whose denominator has been inverted prior to multiplication) and "cultural eutrophication" (nitrogen and phosphorus enrichment of lakes due to runoff from lawns of symphony patrons).

To test your bio-babble acumen, I've developed a short exam. After you complete it, score yourself using the criteria that follow. Be aware, however, that the time-honored method of coin tossing (which has served top scorers on the SAT for years) may fail you here. Go ahead and immerse yourself in this smorgasbord lifted from the lexicon of fisheries and wildlife.

1. **A niche is:**
   - **a.** a place in the ecosystem to which an organism has adapted
   - **b.** French spelling of the contraction n'itch (no, that mosquito bite doesn't itch)
   - **c.** a dish that a real man can feel perfectly comfortable cooking and eating
   - **d.** the place where Moe was most likely to poke fellow Stooge Curly
2. **The definition of recruit is:**
   - **a.** a fish large enough to be kept by anglers
   - **b.** to cruit again
   - **c.** a French pastry featuring various anchovy parts
   - **d.** euphemism for arm-twist
3. **An abomasum is:**
   - **a.** one of a deer's stomachs where parasite abundance is considered an indicator of the health of the herd
   - **b.** a madras shirt worn by the abominable snowman
   - **c.** a character in a Ray Stevens song
   - **d.** a bricklayer in the Australian outback
4. **DO stands for:**
   - **a.** dissolved oxygen; oxygen in the water, available to fish and other gilled organisms
   - **b.** disgusting odor, typical of fisheries biologists after a day in the field
   - **c.** a deer, a female deer
   - **d.** a portal of entry to a room or building
5. **Ichthyofauna is:**
   - **a.** fish
   - **b.** fish
   - **c.** fish
   - **d.** fish
6. **Ichthyofaunal reconstruction:**
   - **a.** the process of introducing fish species at different trophic levels to utilize different levels of the food chain
   - **b.** a supposedly benevolent aid program following the War Between the Northern Fish and Southern Fish
   - **c.** what happens after the moving company drops the carp sculpture
   - **d.** stocking fish

A Bio-Babble Primer

7. Optimum sustained yield is:

- **a.** partitioning a fishery resource among its users to ensure a quality experience, year after year
- **b.** long-term bonds at 14.825%
- **c.** bio-babble at its best
- **d.** a New York City traffic sign

8. An otolith is:

- **a.** an ear stone in a fish; its annual growth rings enable biologists to determine the fish's age
- **b.** a gear in a high-speed retrieve spinning reel
- **c.** an optional component of the Swiss army knife
- **d.** a creature often found in broccoli florets

9. A triploid is:

- **a.** an animal with three sets of chromosomes instead of two, rendering it unable to reproduce
- **b.** a cruel slur for a clumsy person
- **c.** the unusual case where three family members simultaneously have infected adenoids
- **d.** a winning hand in a poker game which requires jackloids or better to open

10. Macrobiotic might best be described as:

- **a.** a theory or practice of promoting longevity
- **b.** a Swedish mutual fund
- **c.** a cure for very large bacteria
- **d.** the Italian synonym for fahrvergnugen

11. Flocculent refers to:

- **a.** the custard-like consistency of lake bottom mud which has not been exposed to air for a long time
- **b.** an actual custard eaten by human infants
- **c.** the sounds made by human infants as they eat that custard
- **d.** the digestive products of a large number of sheep

12. May:

- **a.** a word often used by biologists to avoid drawing a conclusion, even in the face of irrefutable data, as in, "Data reveal that no fish have been seen in this festering cauldron for the past 20 years; therefore, it is possible that the lake *may* no longer be conducive to their reproduction and survival."
- **b.** (choose a.)
- **c.** (choose a.)
- **d.** come on, this is a freebie

Here's how to score yourself:

Number correct	**Category**
10-12	Stay calm; the nice men will come and help you soon.
7-9	You should have my job.
4-6	You're a caring, concerned New Age type of person.
2-3	This was a gift subscription, wasn't it?
0-1	Quick! Come rescue the rest of us!

The clever reader probably picked up on the ingenious pattern of correct responses. The rest of you have to deal with your status on the babble-meter on your own terms. There is little doubt, however, that the jargon has become a permanent part of the '90s. Therefore, whether you're a Babbler-savant or a babbilliterate, with tests like this one to guide you, there is hope. Or should I say, there *may* be.

Answers

1. (a); 2. (a); 3. (a); 4.(a); 5. (a)-(d), unless it took more than ten minutes for you to answer; 6. (a), or (d) for the cynical; 7. (a) and (c); 8. (a); 9. (a); 10. (a); 11. (a); 12. (a), but we'll give you (b), (c) or (d).

Scott Hardin, Biological Administrator II, is the data analysis section leader for the Commission's Division of Fisheries (a biologist who works with computers).

It's The Law

By Inspector Kyle W. Hill

Question: Since bowfishing is legal, how about spearfishing?

Answer: The taking of freshwater fish with spear guns is illegal. Nongame fish other than catfish may be taken during daylight hours from a boat or shore by *manually operated* spears, gigs, snatch hooks, crossbows or bows. There are some local exceptions that prohibit this practice. The taking of any freshwater fish by underwater swimming or diving is prohibited statewide.

Even the possession of a spear gun or other illegal device in or on the fresh waters of Florida is a violation of law. The possession of any freshwater fish together with any device prohibited for taking such freshwater fish is unlawful.

Other prohibited methods of taking freshwater fish include the use of any free-floating, unattached devices, firearms, explosives, electricity, poison or any other harmful substance.

Question: What can I do to help protect endangered and threatened species?

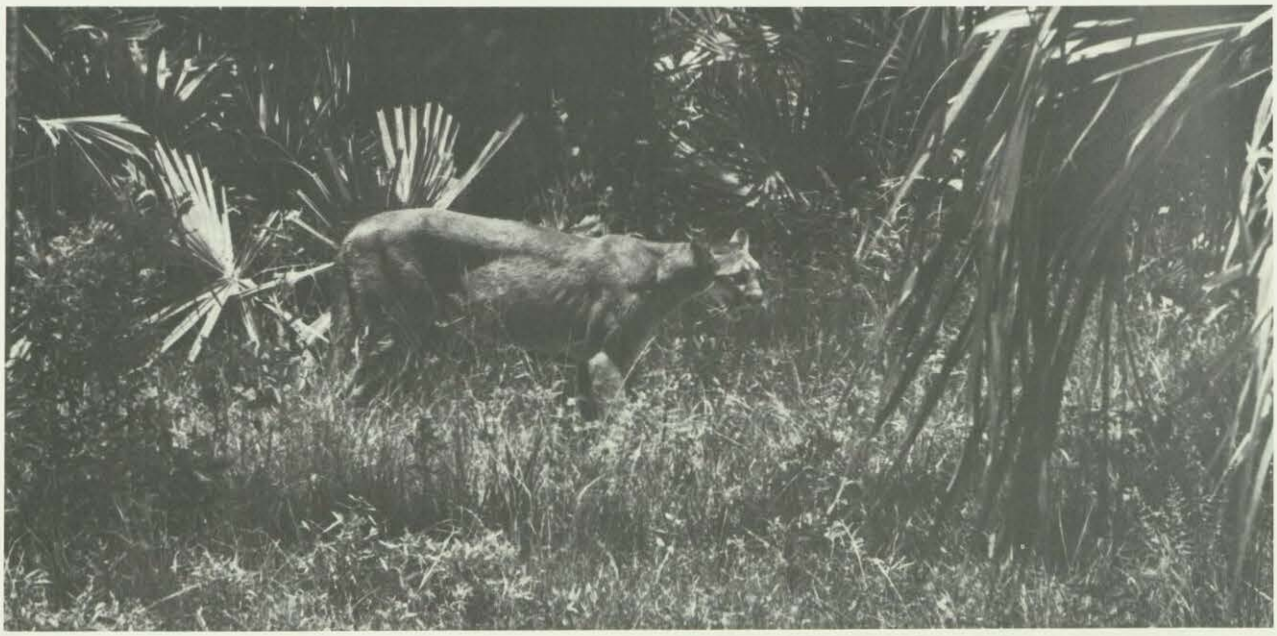
Answer: There are a number of ways you can help. The first is to stay informed. We all must be familiar with the most vulnerable species, their specific needs and their habitat requirements. The Commission is an excellent source of literature on protected species. The regional offices and Tallahassee headquarters have brochures, posters and booklets that cover a wide variety of species and topics. FLORIDA WILDLIFE is another good source. In addition to occasional feature articles, the "Delicate Balance" column in each issue focuses on a species of our state's flora and fauna classified as endangered, threatened or a species of special concern. Don't forget to consult your local public library as well.

A second way to help protect native wildlife is to get involved with local conservation efforts. There are several conservation groups that do a great job in targeting vital wildlife issues. The Florida Wildlife Federation and the Florida Audubon Society are two such groups.

Finally, remain alert for violations of laws. protecting endangered and threatened species. If you see or suspect a violation, report it through our Wildlife Alert Program. Callers may remain anonymous if they wish, and each regional office has a toll-free number to receive violation reports 24 hours a day. These numbers are listed in the front of most telephone books and on page 48 of this magazine. Many people are now reporting wildlife and environmental law violations to us by cellular telephone. Since 1979, the Wildlife Alert Program has been responsible for nearly 8,000 arrests and has paid out nearly $140,000 in citizen rewards.

Conserving Florida's wildlife is everyone's business. Our generation is responsible for passing along the rich treasure of natural resources that we inherited from our predecessors. This will not be possible without active citizen support of the Commission's management programs and enforcement efforts.

GFC



By Lt. Rudy Howell
Hunter Education Officer, Northeast Region

Try Bowfishing!

To keep your bow arm in shape this summer, why not try bowfishing? There are a number of freshwater fish that can be taken legally with bow and arrow in Florida. The most popular, and considered good table fare by many, are tilapia (Nile perch) and gar. Other legal species are chubsuckers and bowfin (mudfish). Mullet, a saltwater fish commonly found in freshwater rivers, also offers a challenging shooting experience and good eating.

Tilapia, introduced into Florida years ago, have adapted remarkably well. One of the most popular bowfishing areas for tilapia is Lake George and the springs that empty into it.

Three species of gar are present in Florida waters. Longnose gar are found throughout the state, but alligator gar, which can grow quite large, and spotted gar are found only in the northwest portion of the state. Gar have a surprisingly hard outer skin, which can be cut easily with tin-snips. The meat along the backbone is white and bone-free.

Bowfishing is quite a challenging sport. Because of the refractive qualities of water, the shooter cannot rely on bow sights and must aim under or below the target. Consequently, it usually takes many shots to develop the instincts and quick reactions necessary to estimate the depth, direction and speed of a fish. Only when shooting almost straight down can you aim directly at a fish.

Most any type of bow can be used. Although many experienced shooters prefer the older style recurve bow, I recommend the compound bow. Its mechanical advantages, flatter-shooting, faster arrow speed and ease of holding at full draw make it more efficient.

Compound bows have a threaded hole on the face of the bow below the grip for mounting a stabilizer or bowfishing reel. There are several types of bowfishing reels available, but one familiar to most sportsmen is the closed-face spinning reel. Bowfishing reels of this type use a short, rod-style handle with a bolt protruding from the end to attach to the bow. The reel should be large enough to hold 50 yards of 60- to 70-pound test line. Most anglers prefer braided nylon or Dacron line, which is probably safer than monofilament. The line is tied to a special solid fiberglass, graphite or aluminum arrow affixed with a harpoon-style fishing point for holding fish once they are hit.

Shooting a bowfishing rig requires attention to detail. After nocking an arrow, you must reel in the slack, making sure the line is on top of your bow hand (a leather glove is recommended for this hand). Then push the line release on the reel. To be positive the line will run free, pull a few inches of line out of the reel. Failure to have free-running line could result in an arrow snapping back into your face or breaking the line and flying free.

Mechanical release aids may present a problem, because of the speed required to get off a shot, especially at fast-moving mullet. Most bowfishermen use a shooting glove or finger tab.

Boats used for bowfishing must be stable, as you must stand up to be in the best position to shoot. A deck makes a better shooting platform than a seat, bench or transom. An airboat works well where water is too shallow to operate outboard engines or electric motors. Some bowfishermen choose to wade or stalk slowly along the banks of lakes and streams. In some cases, docks offer good shooting opportunities.

A clear, calm, sunny day will offer the best conditions for bowfishing because there is less surface disturbance and good light penetration. Polarized glasses and a hat or cap for shade will improve your chances of seeing the fish.

This type of fishing has several unique safety measures to consider. You may be standing in or on a boat, an already precarious situation compounded by the fact that you are holding a sharp-pointed arrow. Never go bowfishing alone. If one person shoots while the other operates the boat, each should know what the other is doing. If the operator puts the motor in gear and the bowfisherman is standing and not prepared for the sudden movement, he could easily fall overboard or into the boat. You must always be prepared for any sudden movement of the boat. And always wear a personal flotation device while in the boat.

For bowfishing you will need a freshwater and/or a saltwater fishing license, depending on your quarry. Some counties have special restrictions on bowfishing, and some rivers may run through a wildlife management area, refuge, state park or other area where guns (including bows and arrows) are prohibited. Be sure to check the regulations for the area you plan to fish.

Conservation Update

Compiled by Scott Ball

Wildlife Foundation Honors Brantly

Col. Robert M. Brantly, executive director of the Game and Fresh Water Fish Commission, recently returned from a meeting in Canada with another prestigious award.

The National Fish and Wildlife Foundation named Brantly the winner of its Guy Bradley Award at a conference in Edmonton, Alberta. The foundation honored Brantly for his lifetime dedication to protecting natural resources and his service in wildlife law enforcement since 1957.

The award is named in honor of Florida conservation officer Guy Bradley, who was killed in the line of duty in 1905 while protecting a Florida Bay rookery from plume hunters.

In his 33-year career, Brantly has received numerous honors at the local, state, national and international levels. A partial list includes the State Official Award from Safari Club International, the Distinguished Service Award from the Southeastern Association of Fish and Wildlife Agencies and both the Ernest Thompson Seton and Seth Gordon awards from the International Association of Fish and Wildlife Agencies.

Boat-Handling Tips

Got a new boat? Congratulations, and please allow us to pass along a handling tip or two, courtesy of Mercury Marine.

Don't expect your craft to be as responsive as your auto when it comes to steering. Since a boat has no tires pressing onto the pavement, it steers by deflecting the propeller thrust, which tends to be weak at slow speeds, resulting in sluggish steering.

While turning the wheel pushes the stern to one side, it's actually water pressure on the forward part of the hull that turns the boat. Most fast boats tend to float with bow up and stern down when moving slowly. With the bow high, there is little water pressure for steering purposes. So try asking one or two passengers to move forward so their weight will hold the bow down, making the boat easier to steer. Keeping the passengers forward also makes the craft easier to steer when backing up.

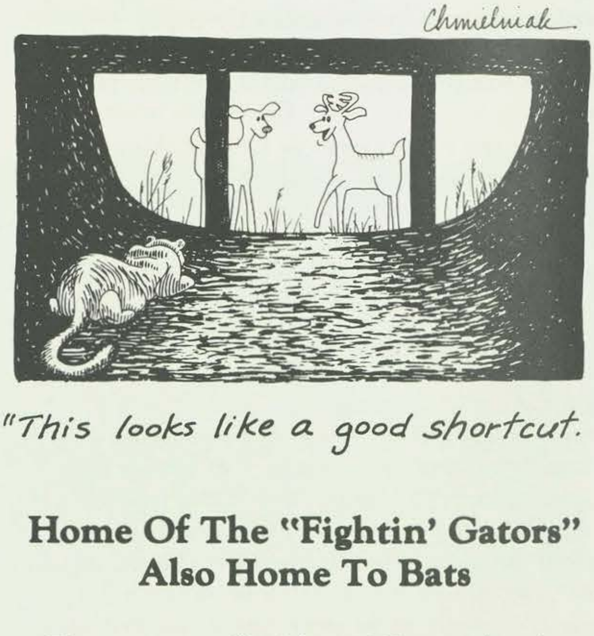
Purchase Of Specialty License Plate Helps Panther

Florida drivers can demonstrate their concern for the plight of our state animal by purchasing a Florida panther license plate.

The tags cost $27 more than regular license tags, but 50 percent of the added amount goes to the Florida Panther Research and Management Trust Fund administered by the Game and Fresh Water Fish Commission. The remainder is equally divided between the Save Our State Environmental Education Trust Fund in the Department of Natural Resources and the Florida Communities Trust Fund in the Department of Community Affairs and is used for education and habitat protection, respectively.

The continued availability of panther tags after June 30 depends on the passage of legislation currently being considered by the Florida House and Senate.

While you're purchasing your new panther license tag, why not add an extra $1 for the Nongame Wildlife Trust Fund? Your donation helps fund research and management projects and public education on behalf of the 85 percent of native wildlife species classified as nongame.



"This looks like a good shortcut."

Home Of The "Fightin' Gators" Also Home To Bats

They may not call it "Animal House," but the University of Florida is building a "dormitory" for bats. Officials hope more than 4,000 bats will take up residence there when construction is complete.

The University Athletic Association (UAA) is funding the construction project with hopes that the new structure will lure the flying mammals away from their current residence: the school's track and tennis stadiums. The bats live in the cracks and crevices in the structures, creating a nuisance with their squeaking and smelly droppings.

"We could have just plugged the stadium holes, but then they might resettle at the football stadium or some other campus building," said Danny Sheldon, UAA's bat project manager. "Getting them out of the football stadium would be a real problem."

Once the smell of the construction materials has dissipated, bat guano will be rubbed on the structure to lure bats to their new homes. Prior to relocation, groups of bats will be trapped and locked into the building for 24-hour periods to acclimate them to their new home.

A 1989 census estimated the campus population of Brazilian free-tailed bats, one of 16 bat species in Florida, at 3,000. Their numbers have since grown to an estimated 4,000, according to officials.

Urban Trees: Carbon-Absorbing Energy Savers

While the United States has less than 10 percent of the world's population, we account for 25-30 percent of the world's energy consumption. One way to save energy, besides carpooling and adjusting our thermostats, is to plant trees.

A California study shows that strategically planting three additional trees around a house can result in a 30 percent savings in annual cooling energy. By reducing energy consumption, and therefore the burning of fossil fuels, an urban tree can cause a reduction in carbon dioxide emissions equal to 15 times the amount the tree alone can absorb.

Here are some other interesting facts about urban trees as reported by Florida's Division of Forestry.

- There are 1.5 billion trees in American cities and towns.
- One acre of mature trees can remove as much as 10 tons of carbon dioxide from the atmosphere each year.
- The amount of carbon stored annually by an acre of trees is approximately equal to that found in 5,200 pounds of carbon dioxide released by burning 1,000 gallons of gasoline.
- Atlanta has lost about 20 percent of its trees in the past 15 years. During that time the average summer temperatures in the metropolitan area have climbed nearly 4 degrees.
- The energy savings and carbon absorption of an urban tree is approximately 15 times the carbon mitigating effect of a forest tree.
- Each American produces about 2.3 tons of carbon annually, half of it from our automobiles.

Two Ways To Recycle Paper Organically

Recent issues of *Magazine Week* have called attention to two ways of recycling paper you may not have considered.

By nature of their business, printers have a lot of scrap paper on their hands. They usually sell most of it to brokers who, in turn, sell it to recyclers. Arcata Graphics/Baird Ward, a Tennessee firm, sells some of its paper to pig farmers.

"The pigs eat it for food," according to marketing manager Tom Carroll. "It's shredded up and mixed in with their food — maybe like Hamburger Helper for people."

A subsequent issue reported that cattle may soon be eating all the news that's fit to print — up to 10 pounds of newspapers a day. Scientists at the University of Illinois are studying ways to treat newsprint for feeding to cows.

"Our approach is to increase (newsprint's) digestibility by treating it with chemicals similar to those found in the animal's stomach," said Larry Berger, a scientist at the University's College of Agriculture.

The newsprint would be treated in a mild solution of hydrochloric acid and a small amount of hydrogen peroxide, then heated. Preliminary results indicate that treated newsprint could replace 20-40 percent of a cow's daily hay intake, providing a digestible, supplemental energy source, he added.

But don't expect Bossy to be munching on old copies of FLORIDA WILDLIFE. The process seems to work better for newsprint than for coated stock and four-color artwork typically found in magazines. Berger estimated that the newsprint-as-food concept could result in a 10-15 percent reduction of waste products heading to landfills.

Now that's what we call readers' digest.

REPORT WILDLIFE LAW VIOLATORS AND POLLUTERS

CALL TOLL FREE

Panama City: 1-800-342-1676
Lake City: 1-800-342-8105
Lakeland 1-800-282-8002
Ocala: 1-800-342-9620
West Palm Beach: 1-800-432-2046

FLORIDA GAME AND FRESH WATER FISH COMMISSION REGIONAL OFFICES

Northwest Region
6938 Highway 2321
Panama City, FL 32409-9338
Telephone (904) 265-3676

Northeast Region
Rt. 7, Box 440
Lake City, FL 32055
Telephone (904) 758-0525

Central Region
1239 Southwest 10th Street
Ocala, FL 32674
Telephone (904) 732-1225

South Region
3900 Drane Field Road
Lakeland, FL 33811
Telephone (813) 648-3203

Everglades Region
551 North Military Trail
West Palm Beach, FL 33415
Telephone (407) 640-6100

ARE YOU MOVING?

Please Use This Form (or a copy) for Address Changes.

Attach a recent magazine address label here.

Please type or legibly print your new address below:

Name ______________________

Address ______________________

____

City ________ State ____ Zip ____

EFFECTIVE DATE OF CHANGE: __________

IF YOU MISS AN ISSUE

Please Use This Form (or a copy) to Request Replacements.

Name ______________________

Address ______________________

____

City ________ State ____ Zip ____

ISSUE NOT RECEIVED: __________
(Months and Year)

MAIL FORMS TO: FLORIDA WILDLIFE Magazine
Circulation Department
620 South Meridian Street
Tallahassee, FL 32399-1600

OR CALL: (904) 488-5563

This agency and the Department of Interior prohibit discrimination by race, color, nationality, age, sex or handicap. If you believe you have been discriminated against in any program, activity or facility of this agency, write to: Florida Game and Fresh Water Fish Commission, 620 South Meridian Street, Tallahassee, FL 32399-1600; or to: Office for Human Relations, USFWS, Department of Interior, Washington, D.C. 20240.

Floridana

When's the last time you spotted a "pitying" of turtle doves, an "unkindness" of ravens, a "parliament" of owls, or an "exultation" of larks?

Generally "birds of a feather flock together," whatever their group-epithet. This can sometimes be said of humans who watch them, those millions of lovable "birders" who spend approximately $14 billion a year on this popular pastime.

The sport attracts dedicated "listers" worldwide, especially when there's an opportunity to spot a "lifer," a species hitherto unrecorded. In England, nearly 2,000 birders descended on a community when a golden-winged warbler showed up.

Yet, even a knowledgeable "ticker" might not know all the facts, figures and folklore contained in *The Birder's Miscellany*, an engrossing book by Scott Weidensaul. I found fascinating references to many of Florida's native birds and introduced species. The book describes the misguided efforts of some over-zealous New Yorkers who brought the bothersome starling to America merely because it was mentioned in one line of one play. The American Acclimatization Society, devotees of Shakespeare's work, thought it would be a great idea to introduce every bird mentioned in the Bard's writings to the United States, much to the detriment of the eastern bluebird and other native birds.

The prolific cattle egret was dubbed "the white starling," a dubious distinction that refers to its incredible population growth. It was first sighted in 1941 in Clewiston, and within 20 years was found over most of the Southeast and mid-Atlantic states. This bird not only gets around well, but is a good follower. It has adapted its foraging methods from following African wild grazing animals to trailing behind Florida's horses, cows and farm machinery to get fast food, bird-style.

But, I learned that it's not really commendable to "eat like a bird," since birds consume up to 20 percent of their body weight daily. "Yew are what yew eat" may untangle the new mystery of why some immature cedar waxwings sport burnt-orange tail feather tips instead of bright yellow ones. Scientists think it's from the pigment found in the ornamental yew. Did you know that when a woodcock probes the damp earth for worms, it sometimes stomps its feet sharply, probably stimulating the worms into movement as humans do when they grunt up worms with a worm-fiddling stick? And, the green-backed heron actually has learned a new fishing method of dropping bread crumbs into the water to chum up minnows.

Most people recognize the barred owl's query of "*Who cooks for you, who cooks for you all-l-l?*" But did you know that to attract a mate, the northern mockingbird may embellish its repertoire of other birds' notes, phrases and songs with imitations of police whistles and sirens, barking dogs and other noises?

By trying to interpret bird songs and antics, people have created weather-related folklore to explain that geese honk a warning before a storm and that when gulls stay close to shore, so should you.

Our fine feathered friends continue to inspire flights of fancy through legends, art, music and literature.

— Andrea H. Blount

Plucked from *The Birder's Miscellany* (1991) with permission from Fireside Books, Simon & Schuster.

PPerkerson'91